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PEABODY VEGETATION MANAGEMENT PROJECT

**Towns of Gorham, Shelburne, and Martin's Location
Coos County, New Hampshire**

Environmental Assessment

**Prepared By
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Peabody Vegetation Management Project EA - Summary

The Androscoggin Ranger District of the White Mountain National Forest is proposing the following management activities for the Peabody Project (Alternative 3):

- Timber harvest of 4.6 million board feet on 1,248 acres of National Forest land within Habitat Management Units (HMU) 213 and 214, utilizing both even-aged and uneven-aged management techniques;
- Perform restoration maintenance on 4.8 miles of existing Forest Service roads (Forest Roads 72, 207, 224, 263, 615 and 615A), and re-establish 17 log landings. Maintenance on Forest Road 72 includes replacing 18 timber stream crossings with metal culverts, and replacing the existing timber bridge across Culhane Brook with a steel bridge;
- Construct 150 feet of temporary road leading into stand 40/102 in HMU 214 and place a temporary bridge across Imp Brook for the duration of the project and;
- Assign a Management Area (MA) 2.1 designation to approximately 295 acres of land within HMU 214 that had not previously had an MA designation.

The management activities summarized above are actually a modification of the original Proposed Action, which had been presented to the public for comment in February, 2003. The changes from the original that are proposed in this “Modified Proposed Action” are in response to comments received during the scoping process, as well as new information from updated field inventories and internal review.

The **Analysis Area** for the Peabody Project is HMUs 213 and 214 and encompasses 28,080 acres of National Forest land. Of this, approximately 10,154 acres are within Management Area designation 2.1 and 3.1 which prescribes vegetation management to achieve the goals and objectives of the White Mountain National Forest Land and Resource Management Plan (LRMP, 1986). The **Project Area** is the portion of the Analysis Area that includes stands proposed for vegetative management, as well as the area associated with connected actions (roads and landings). For the Modified Proposed Action it is 1,248 acres of National Forest lands proposed for harvest located in the towns of Gorham, Martins Location, Beans Purchase, Thompson and Meserves Purchase, Greens Grant and Shelburne, Coos County, New Hampshire, on the Androscoggin Ranger District of the White Mountain National Forest.

An Interdisciplinary Team (IDT) of Forest Service resource specialists chose the initial treatment areas as a result of an analysis of the existing habitat conditions within HMU 213 and 214 (**Purpose for the action**). Comparing the existing conditions to the desired conditions outlined in the Forest Plan, the IDT identified a need to increase age class and habitat diversity, enhance softwood production on appropriate sites, improve stand conditions for optimum tree growth, and provide quality wood products (**Need for the action**).

The **Modified Proposed Action** is likely to result in the following effects:

- Even-aged timber harvest using clearcuts and seed tree cuts would regenerate even-aged stands of northern hardwoods, paper birch and aspen; contributing to diversity of community types and age within the Analysis Area, and providing early-successional habitat, a key component of a landscape that supports a variety of wildlife.

- Logging and road restoration activities may result in local, short-term, direct and indirect effects to natural resources within the Analysis Area, including soil compaction and erosion, soil calcium loss, sedimentation where roads and skid trails cross streams, and potential for increased water yield from harvested areas. Mitigation measures will be used to lessen or eliminate these effects, and diminish their contribution to any long-term cumulative effects of similar activities in the Analysis Area.
- Noise and traffic generated during logging and road restoration operations may affect wildlife behavior in the Project Area; as well as the recreation experience in nearby Barnes Field campground, Hayes Copp ski trail, Daniel Webster hiking trail, Pinkham B and Shelburne snowmobile trails, and Pinkham B and Bear Springs roads.
- Temporary openings in the forest landscape, resulting from even-aged timber harvest, would be visible from the Presidential Range, Crescent Mountain, Pine Mountain, the Appalachian Trail, and adjacent roads and trails;
- There is a potential gross return of \$752,675 to the US Treasury, from which \$75,000 would be reimbursed to Coos County and the Towns of Gorham and Shelburne through the New Hampshire 10% Timber Yield Tax, and \$188,169 would be reimbursed to Coos County through the National Forest 25% Fund.

In addition to the Modified Proposed Action (Alternative 3) described above, the IDT considered alternative proposals for addressing the Purpose and Need for this project. Three of these alternatives were developed and analyzed in detail, including Alternative 1, the “No Action” alternative; Alternative 2, the Original Proposed Action; and Alternative 4, an alternative that proposes fewer acres of even-aged harvest. The proposed activities for each of these alternatives are summarized in Table A; and a more detailed description and analysis of effects for each alternative is included in Chapters 2 and 3 of this EA.

Table A. Activities Proposed for Peabody Project, By Alternative

Proposed Activity	Alt 1	Alt 2	Alt 3	Alt 4
Timber Harvest (Acres)				
Clearcut & Patchcut	0	115	89	49
• Regeneration Objective	(0)	(105)	(80)	(40)
• Permanent Wildlife Opening Objective	(0)	(10)	(9)	(9)
Seed Tree Cut	0	34	27	14
Individual Tree and Group Selection Cut	0	905	888	941
Commercial Improvement Cut and Commercial Thinning	0	317	244	244
Transportation System (Miles)				
Miles of Road Restoration	0	5.3	4.8	4.8
Miles of Temporary Road Construction	0	0	0.03	0.06

The Modified Proposed Action (Alternative 3) is the preferred alternative of the Forest Service. It would meet the Purpose and Need for this project while adequately addressing concerns about possible soil erosion and visual effects.

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CHAPTER ONE – INTRODUCTION

1.0 Introduction and Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into five parts:

- **Purpose and Need for Action:** The section includes information on the history of the project proposal, the purpose of and need for action, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives, including the Proposed Action:** This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public, the Forest Service and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- **Environmental Consequences:** This section describes the environmental effects of implementing the proposed action and other alternatives and is organized by resource area. Within each section, the affected environment is first described, followed by the effects of the No Action Alternative (provides a baseline for evaluation and comparison of the other alternatives that follow) and then the effects of the proposed alternatives.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the Project Planning Record located at the Androscoggin Ranger District Office in Gorham, New Hampshire.

1.1 Background

The Peabody Environmental Analysis combines two previously scoped projects, North Carter (1997) and Pine Mountain (1999). A scoped project is one that has been previously proposed to the public for comment. Scoping is the process of requesting public input on issues and concerns related to a Proposed Action. Since the time these

two projects were initially scoped, substantial changes have been made to each proposal. The Proposed Action for the Peabody project reflects these changes as well as new findings and analysis.

The original Proposed Action for the Peabody project combined a vegetation management proposal with a recreation proposal that included development of a mountain bike trail system, relocation of the Ledge Trail, and construction of a trailhead parking lot. Though these proposals were jointly scoped, they are not dependent on each other and this analysis will focus only on the vegetation management proposal. A separate analysis will be conducted for the recreation projects at a future date.

The Project Area is the National Forest lands proposed for vegetative management. It is located within the Towns of Gorham, Martins Location, and Shelburne in Coos County, New Hampshire, on the Androscoggin Ranger District of the White Mountain National Forest (Appendix A, Map 1A).

The Project Area has been and continues to be managed for a variety of activities. It has a history of vegetation and wildlife habitat management dating back to the late 1800's and continues to be actively managed today. Aside from timber harvest, the area offers a wide variety of recreation activities, including hiking, scenic and fall foliage viewing, camping, cross-country skiing, snowmobiling, mountain biking, swimming, snowshoeing, wildlife watching, hunting, fishing, and cutting Christmas trees and firewood.

The Analysis Area is the larger National Forest management unit within which the Project Area is found. It consists of "Habitat Management Units" (HMU) 213 and 214, and is approximately 28,080 acres in size. A Habitat Management Unit is described in detail in Appendix B of the 1986 White Mountain National Forest Land and Resource Management Plan (hereafter referred to as the Forest Plan). A brief description of the management strategy for HMUs can be found in Section 1.1.1 of this EA.

HMU 213 encompasses 17,285 acres of National Forest land, of which 6,790 acres are allotted by the Forest Plan to Management Areas (MA) 2.1 and 3.1, or lands considered suitable for timber harvest. HMU 214 encompasses 10,793 acres of National Forest land, of which 3,364 acres are allotted to MAs 2.1 and 3.1. Map 1B in Appendix A shows the location of HMUs 213 and 214 in Coos County.

HMU 213 includes several hiking trails, such as Ledge, Pine Link, Daniel Webster, Bear Springs and Pine Mountain. The latter two, as well as the Pinkham B road, serve as snowmobile routes. Hayes Copp cross-country ski trail is also in HMU 213. HMU 214 contains several hiking trails, such as Rattle River, Stony Brook and Imp; and one snowmobile trail, Shelburne, also known as Corridor 19.

1.1.1 White Mountain Land and Resource Management Plan – Final Environmental Impact Statement and Record of Decision, as Amended (USDA, 1986, FEIS)

The White Mountain National Forest (WMNF) has prepared this Environmental Assessment (EA) in accordance with the White Mountain National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision, as Amended (USDA, 1986 FEIS).

The Forest Plan is a programmatic document required by law that implements the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). The purpose of the Forest Plan is to provide direction for multiple use management and sustained yield of goods and services from National Forest lands in an environmentally sound manner.

The Forest Plan sets management direction for the White Mountain National Forest through the establishment of short term (10-15 years) and long-term (through the year 2036) goals and objectives. It prescribes the standards, practices, and the approximate timing and vicinity necessary to achieve goals and objectives. The Forest Plan allocates National Forest lands to particular “Management Area” prescriptions, establishes monitoring and evaluation necessary to ensure that direction is being followed and is working as intended, measures quality and quantity of actual operations against predicted outputs and effects, and forms the basis for implementing revisions.

In addition to allocating lands, the Forest Plan establishes a strategy to manage well distributed and suitable wildlife habitat for maintaining viable populations of existing native and desired non-native vertebrate species. To provide the necessary habitat diversity for wildlife populations, the Forest Plan designated “Habitat Management Units” (HMUs) to distribute community types across the National Forest. Of the 780,000 acres comprising the White Mountain National Forest, approximately 345,000 acres are considered “suitable lands” where vegetative management is permitted through the use of commercial timber harvesting. These suitable lands are typically in lower elevations and include Management Areas 2.1 and 3.1, where timber harvest is utilized to maintain variety in wildlife habitat and to generate timber products. Each HMU contains an unspecified amount of non-managed lands (where no timber harvesting is allowed), and at least 4,000 acres of suitable lands in Management Areas 2.1 and/or 3.1. Non-managed lands may include Management Areas 6.1 and 6.2, where non-motorized recreation is emphasized and timber harvest is either limited to salvage operations (6.1) or not permitted at all (6.2). Non-managed lands comprise nearly 410,000 acres of the Forest, providing a significant amount of mature and overmature wildlife habitat.

The Desired Future Condition (DFC) of an HMU is intended to provide a variety of habitat types and age classes (together defined as community types) to meet the life cycle needs for the wildlife species that inhabit the National Forest (DeGraaf et al. 1992, DeGraaf and Yamasaki 2001). Examples of habitat types include “northern hardwood”, “spruce-fir” and “paper birch”. The age classes are based on stages of natural forest

succession, ranging from the “regeneration” (0-9 years) phase of forest growth to the “overmature” (beyond the age when growth begins to decline) phase. Wildlife species that require or otherwise utilize “early-successional” vegetation will benefit from the availability of forest stands in the regeneration phase of growth. The same correlation is true for mature and overmature stands and those wildlife species that require or otherwise utilize “late-successional” vegetation. Early-successional vegetation is characterized most often by dense, ground-level plant cover in areas open to direct sunlight. Late-successional vegetation is more typically characterized by large, mature woody vegetation with a closed canopy (foliage) that blocks sunlight from the ground. A more detailed explanation for how the distribution of habitat types and age classes determine where and when the White Mountain National Forest proposes to harvest timber can be found in Chapter 1.3.1 (Need for Change) and Chapter 3 (Section 3.2, Vegetation, and Section 3.9.1, Wildlife Habitat).

NFMA states that Forest Plans “shall be revised from time to time when the Secretary finds conditions in a unit have significantly changed, but at least every 15 years” (16 U.S.C. 1604(f)(5)). However, Congress did not intend management to cease if the 15-year target date for plan revision was not met. NFMA, Section 1604 (c) illustrates this point. In the development of the original forest plans, Congress specifically allowed management of the forests to continue under existing resource plans pending approval of the first NFMA forest plan for each administrative unit. Section 321 of the Fiscal year 2003 Interior Appropriations Act included language that allowed National Forests to continue managing. The language states “Prior to October 1, 2003, the Secretary of Agriculture shall not be considered to be in violation of subparagraph 6(f)(5)(A) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1604(f)(5)(A) solely because more than 15 years have passed without revision of the plan for a unit of the National Forest System.”

A Notice of Intent to revise the Forest Plan was published February 14, 2000, and the revision process is underway. The Final Environmental Impact Statement is expected some time in the winter of 2004.

1.2 Purpose for the Action

The Purpose for this project is to accomplish resource objectives to meet the overall management direction for the White Mountain National Forest, as established in the Forest Plan (USDA 1986a. Forest Plan, III 30-41). Within the Project Area, the Forest Plan establishes the following goals for Management Areas 2.1 and 3.1:

The goals for MA 2.1 are to:

- Provide moderate amounts of high quality hardwood sawtimber and other timber products on a sustained yield basis,
- Provide a balanced mix of habitats for all wildlife species.

The goals for MA 3.1 are to:

- Provide large volumes of high quality hardwood sawtimber on a sustained yield basis and other timber products through intensive timber management practices,
- Increase wildlife habitat diversity for the full range of wildlife species with emphasis on early-successional species,
- Grow small diameter trees for fiber production

1.3 Need for the Action

An Interdisciplinary Team (IDT) of Forest Service resource specialists chose the initial treatment areas because an analysis of HMUs 213 and 214, comparing existing habitat conditions to desired conditions as outlined in the Forest Plan, indicated there is a Need to increase age class and habitat diversity (Forest Plan, VII-B-12/13), enhance softwood production on appropriate sites, improve stand conditions for optimum tree growth and provide quality wood products.

The Forest Plan allotted the 28,080 acres of National Forest (NF) lands within HMUs 213 and 214 to particular Management Areas, based on a series of factors, such as soils, elevation, community types, accessibility, etc. Lands allotted to MAs 2.1 and 3.1, the only lands where timber harvest is permitted, comprise 10,154 acres, accounting for 36.2% of the NF lands in the Analysis Area. Lands allotted to MAs 6.1 and 6.2 comprise 15,284 acres, or 54.4% of the NF lands in these two HMUs. An additional 2,608 acres (9.3% of NF lands) are allotted to MA 9.4, a designation for NF lands in which a management prescription, and management activities, are deferred until the Forest Plan is either amended to provide specific direction for these lands, or revised to provide a new management direction for the National Forest as a whole. Another 34 NF acres are allotted to MA 8.1 for the Snyder Brook Scenic Area.

1.3.1 Need for Change

The Forest Plan establishes a “Desired Future Condition” (DFC) for each Management Area. The need for change within a particular Management Area is determined by comparing the DFC with the existing ground condition (EC). For MA 2.1 and 3.1 lands within HMUs 213 and 214, the Interdisciplinary Team (IDT) identified the existing conditions, and then compared them to the DFC to determine where change was needed. Tables 1A and 1B, which display both the existing condition and the desired condition, show only those opportunities where DFC can be achieved through vegetative management. The project planning record contains the full comparison of EC to DFC.

Table 1A. Acres by Community Type in MAs 2.1 and 3.1 for HMU 213

Community Type	Existing	Desired Future Condition	Need
Hardwoods/mixedwoods (regeneration)	103	143	40
Spruce/Fir	505	1543	1038
Permanent Wildlife Openings	101	194	93

Table 1B. Acres by Community Type in MAs 2.1 and 3.1 for HMU 214

Community Type	Existing	Desired Future Condition	Need
Hardwoods/mixedwoods (regeneration)	0	119	119
Paper Birch (regeneration)	0	34	34
Aspen (regeneration)	0	26	26
Permanent Wildlife Openings	14	117	103

Openings in the forest canopy, or overhead leaf cover, introduce direct sunlight to the forest floor, encouraging the growth of “early-successional” plant species. These plant species thrive in sunlit conditions, and are typically the first to revegetate an area that was once but is no longer shaded. The conditions favoring plants that thrive on direct sunlight are referred to as “early-successional habitat”. Some wildlife species need early-successional plant habitat to survive, while other wildlife species utilize a variety of habitats that includes the early-successional habitat. In either case, this habitat is a critical component of a landscape that supports a variety of wildlife. In establishing desired conditions for HMUs, the Forest Plan recognizes the need for early-successional habitat, and permits the use of commercial timber harvest to establish conditions favorable to this habitat in a limited number of acres. This includes harvest methods such as clearcuts, seed tree cuts or shelterwood cuts that remove most of the existing woody vegetation from a stand, and thus promote a component of regenerating and young growth within a larger landscape of mostly mature, closed canopy forest. This kind of “even-aged harvest” is typically employed with those species and community types that regenerate best in early-successional conditions, such as paper birch, aspen and some hardwoods.

At the same time the Forest Plan prescribes even-aged timber harvest to promote early-successional wildlife habitat and vary stand structure, it prescribes an equal amount of uneven-aged timber harvest to promote the regeneration of those plants that thrive in shaded conditions. These plants typically grow best in the understory of a taller forest, often gaining a foothold where breaks in the canopy introduce a limited amount of sunlight to the forest floor. Uneven-aged harvest removes individual trees or small groups of trees to open pockets of sunlight. Where even-aged harvest maintains different structure from one stand to the next, with different species or communities often dominating from one stand to the next; uneven-aged harvest maintains structural variety

within certain stands. Species and community types that regenerate best with uneven-aged harvest include spruce-fir, hemlock, and some hardwoods (sugar maple, oak).

Both even-aged and uneven-aged timber harvest allow the use of wood for forest products, while mimicking the natural processes that would normally regenerate a forest. Even-aged harvest tends to mimic larger scale disturbance, more on the line of an ice storm, flooding, infestations or fire. In fact, a 1998 ice storm impacted several stands in HMU 213, essentially causing mortality that opened several acres of canopy on a scale similar to stands with even-aged harvest prescriptions. The ice storm resulted in an addition of approximately 49 acres of northern hardwoods to the regenerating age class in HMU 213. Uneven-aged stands mimic the smaller scale regeneration resulting from the natural mortality of individual trees or limited disturbance like lightening or wind storms. In the 54% of HMUs 213 and 214 that are within MAs 6.1 and 6.2, natural disturbance is the only means by which community types regenerate.

A look at Tables 1A and 1B shows that, in order to meet the habitat and stand structure objectives of the Forest Plan for HMUs 213 and 214, there is a need to establish regenerating stands of aspen, paper birch and northern hardwoods; and to release spruce-fir from the understory of other stands. Commercial timber harvest can be used to achieve these objectives. Even-aged harvest methods can be used to convert mature and overmature northern hardwoods, aspen and paper birch stands to a younger, regenerating age class. Uneven-aged harvest methods can be used to increase the acres of spruce-fir by removing the overstory trees where spruce-fir is in the understory.

Economically, harvesting mature and overmature trees would provide high quality sawtimber to area mills. At the same time, lower quality or damaged trees can be harvested to improve future stand quality and productivity.

1.4 Modified Proposed Action

The Androscoggin Ranger District proposes to address the Purpose and Need for Action in HMUs 213 and 214 by applying silvicultural practices to diversify age class and wildlife habitat, improve future stand quality, enhance growing condition for softwoods and provide quality sawtimber. This Proposed Action is actually a modification of the original proposal, which had been presented to the public for comment in February, 2003. The changes from the original that are proposed in this “Modified Proposed Action” are in response to comments received during the scoping process, as well as new information from updated field inventories and internal review.

The Modified Proposed Action would establish 107 acres of early-successional habitat and 9 acres of permanent wildlife openings by clearcut, patch clearcut or seed tree cut in mature and overmature stands of northern hardwoods, paper birch and aspen. It would harvest another 888 acres using the uneven-aged methods of single tree and small group selection cuts to promote in-stand growth and release small patches of softwoods like spruce-fir and hemlock. And it would treat an additional 244 acres with commercial

improvement cuts or commercial thinnings to improve stand quality. The Project Area totals 1,248 NF acres (Appendix A, Maps 3A and 3B).

To access the harvest areas, approximately 4.8 miles of existing roads (Forest Roads 72, 207, 224, 263, 615, and 615a) and 17 landings would be restored. Roads receiving restoration maintenance are typically classified Forest Service roads that have been closed to vehicle traffic since their prior use and stabilized with erosion control devices such as water bars. Restoration maintenance is the process of rebuilding a road to the standard originally constructed. It may include removing water bars, sod and brush from the road bed; cleaning ditches; replacing culverts and stream crossings; and placing and maintaining surfacing. In the specific case of Forest Road (FR) 72, restoration maintenance includes replacing 18 timber stream crossings with metal culverts, and replacing the existing timber bridge across Culhane Brook with a steel bridge. In addition to restoration of exiting roads, a 150-foot long temporary road would be constructed and a temporary bridge would be placed across Imp Brook to access stand 40/102 in HMU 214. Temporary roads would be closed, stabilized and returned to a natural condition when no longer needed for this project. Restored roads would be closed and stabilized until needed again.

A Forest Plan Amendment would assign a MA 2.1 designation to 295 acres in HMU 214 that is currently on hold in MA 9.4. This land was acquired in 1992 and had not previously been assigned to a Management Area. To do so now requires an amendment to the Forest Plan. This kind of amendment is generally considered “non-significant”; however, because it is proposed as part of a project, it requires a notice and comment period. An MA 2.1 designation would be consistent with past Forest Plan Amendments that assigned this designation to lands with similar characteristics (terrain, operability ratings, distance to roadways, and past management practices). As clarification, the February scoping letter had proposed amending the Forest Plan to designate 1,639 acres of land as MA 2.1. However, a review of the Geographic Information System (GIS) data base found that most of these acres were not part of the National Forest ownership layer.

1.5 Decision Framework

The purpose for this environmental assessment is to provide the Forest Supervisor, the Deciding Official, with sufficient information and analysis to make an informed decision about the Peabody Project given the purpose and need for the action. The deciding official would make the following decisions:

1. Which of the alternatives would best move the Peabody Project Area toward the DFC outlined in the Forest Plan and the Purpose and Need for Action?
2. Which of the alternatives best addresses relevant issues raised by the public and the interdisciplinary team?

3. Would the Proposed Action and its alternatives pose any significant environmental impact to warrant the need for an environmental impact statement?
4. Do the mitigation measures for the proposed Action and its alternatives meet the Forest Plan Standards and Guidelines?

In past environmental assessments, the District Ranger was the Deciding Official, however for this project the Forest Supervisor is the Deciding Official. The reason is that this project includes a Forest Plan Amendment to assign a Management Area to 295 acres of undesignated NF lands that can only be signed into action by the Forest Supervisor. This is considered a non-significant amendment that includes a project-level decision. These actions are connected, therefore they can be analyzed together, and they are subject to public notice and comment. They may be addressed as separate decisions in the same decision document.

1.6 Public Involvement

On February 24, 2003, a scoping letter soliciting comment on the original Proposed Action for the Peabody Project was sent to 370 interested people, adjacent property owners, local newspapers and various agencies and organizations. This project was also listed in the Quarterly Schedule of Proposed Actions for the White Mountain National Forest which is mailed to over 500 people interested in and/or affected by the White Mountain National Forest management. The scoping letter was also posted on our White Mountain National Forest web page (www.fs.fed.us/r9/white). An announcement of the original Proposed Action appeared in the legal notices section of the **Manchester Union Leader** on February 28, 2003.

Eleven (11) responses to the scoping letter were received. These responses have been used to formulate alternatives and mitigation measures, and define the analysis.

1.7 Issues Used to Develop Alternatives

Using issues received from the public and within the agency, the interdisciplinary team (IDT) separated issues into two groups: “Issues Used to Develop Alternatives” and “Other Issues Brought Forward During Public Involvement”. The “Issues Used to Develop Alternatives” are typically those that are caused directly or indirectly by implementing the Proposed Action, and for which site-specific alternatives may be developed to meet the Purpose and Need. Appendix C, List of Scoping Comments, lists the issues, concerns and comments raised by the public and the Forest Service responses.

Measurement indicators were developed for each issue and are a means of comparing alternatives. Table 5 in Chapter 2 provides a summary of the characteristics of each

alternative, including measurement indicators. One issue raised during the scoping process resulted in the development of an alternative to the Proposed Action.

1.7.1 Vegetative Issues

One respondent requested that the acres of proposed clearcuts in the Project Area be changed to single tree selection to maintain a closed canopy forest in the area (see Appendix C). This issue is addressed in Alternative 4, which is described in Chapter 2. The measurement indicator for evaluating the effects of this issue for each alternative will be the “number of acres clearcut”.

1.8 Other Issues Brought Forward During Public Involvement

The site-specific issues listed in this section were not used to generate an alternative, but they are considered in the analysis of effects found in Chapter 3.

1.8.1 Soils

One respondent was concerned with soil compaction resulting from timber harvesting, especially on Ecological Land Types 115A and 115G, and its effect on forest health and productivity. Soil compaction is addressed in Section 3.6.1 (Soil Erosion).

1.8.2 Recreation

One respondent was concerned that proposed harvesting activities may increase noise levels to nearby hiking trails.

One respondent questioned the effects of logging on the Daniel Webster Trail.

One respondent questioned the impacts of road restoration on the Hayes Copp ski trail.

Each of these concerns is addressed in Section 3.3 (Recreation).

1.8.3 Visual Quality

Due to past harvesting in the Project Area, one respondent wanted to ensure that Visual Quality Objectives (VQOs) for the Pine Mountain, the Presidential Range and the Appalachian Trail viewsheds would be met. Visual Quality Objectives are addressed in Section 3.7 (Visual Quality Objectives).

1.9 Applicable Regulatory Requirements & Required Coordination

NFMA (National Forest Management Act)

NFMA gives direction for developing, maintaining and revising plans for individual units of the National Forest System. This includes direction for maintaining multiple use and sustained yield of forest products and services, insuring consideration of economic and environmental aspects of various systems of resource management, providing for diversity of plant and animal communities, and insuring that timber will be harvested only where suitable. As an example, the wildlife strategy developed in the 1986 White Mountain National Forest Plan provides the direction for managing for wildlife habitat diversity on the Forest.

NEPA (National Environmental Policy Act)

NEPA gives direction to analyze and assess environmental conditions and consequences of planned and proposed actions. CEQ (Council on Environmental Quality) Regulations and the Forest Service Manual and Handbooks give direction and guidelines for conducting the analysis.

New Hampshire SHPO (State Historic Preservation Officer) Review

Before a decision is made for a project, State Historic Preservation Office (SHPO) reviews the cultural resource report for the project. We have received concurrence from SHPO on the cultural resource report and approval to implement the project with mitigations measures.

MBTA (Migratory Bird Treaty Act)

This project is consistent with the Migratory Bird Treaty Act. The White Mountain National Forest is actively involved with Partners in Flight program to protect neo-tropical migrants. The Forest also recently completed a Species Viability Evaluation (SVE) process to identify species that might have a potential viability concern on the Forest. Migratory birds were considered in this review. Any species identified through this process, including migratory birds, that have a viability concern are evaluated.

USFWS (United States Fish and Wildlife Service)

The USFWS will be asked to review the biological evaluation (BE) for federally listed threatened and endangered species (TES) prior to any decision.



Figure 1. Panoramic view looking east from the ledges on the Pine Mountain viewpoint. HMU 213 is in the foreground. The Stony Brook residential development is in the middleground (on the east side of Highway 16). HMU 214 is in the middleground and the background. Mt. Moriah is in the background left, and Mt. Imp is in the clouds in the background right. Some of the proposed harvest units might be visible in the right foreground and middleground from this viewpoint. The proposed Rattle River harvest units are not visible from this viewpoint. Section 3.4 looks at the potential effects of the proposed project on visual quality.

CHAPTER TWO – ALTERNATIVES

2.0 Formulation of Alternatives

This chapter provides a detailed description of the Proposed Action and alternatives to the Proposed Action. Alternative 1, referred to as the “No Action” alternative, proposes that no vegetative management activities be conducted within the Peabody Project Area. Consideration of a No Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA), and is intended to contrast the effects of no action to the effects of action alternatives. Alternatives 2, 3 and 4 are referred to as “Action Alternatives”, since each of these alternatives proposes some level of vegetative management activities within the Peabody Project Area. Alternative 2 is the “Original Proposed Action”. This alternative was submitted to the public for comment in February 2003. Alternative 3 is the “Modified Proposed Action”. This alternative incorporates changes resulting from public comments and new information, and it is the preferred alternative of the Forest Service. Alternative 4 was developed in response to a public issue concerning clearcutting, and its effect on visual quality and canopy closure. Each of the Action Alternatives meets the Purpose and Need for Action, although there are differences in the degree to which each alternative moves towards the Desired Future Condition described in the Forest Plan.

The process of designing alternatives to address the Purpose and Need for Action began with a review of existing conditions for HMUs 213 and 214. Compartment vegetative data and records were reviewed to identify stands that could benefit from silvicultural treatment. This data was verified through aerial photographs and field reconnaissance. Site specific concerns related to other resources (such as soil, water, recreation, etc.) were identified and addressed either through mitigation measures or deferring silvicultural treatment where appropriate. Alternative actions were considered for silvicultural treatments, and for contributing towards the Desired Future Condition of the HMUs. From all of these considerations, the Original Proposed Action was developed and submitted to the public for comment (scoping) in February 2003. The Modified Proposed Action, and Alternative 4, were developed to incorporate new information, and address issues raised both internally and by the public during the scoping process.

The Forest Plan lists specific mitigation measures, called Standards and Guidelines, for controlling or alleviating the environmental effects of timber harvesting, road restoration and regular road maintenance. These Standards and Guidelines are required when conducting these activities on the White Mountain National Forest, and they are incorporated into this project by reference. Additional mitigation measures, which go above and beyond the Forest Plan Standards and Guidelines, have also been developed to address concerns specific to the Proposed Action and the alternatives. These site-specific measures, described in Appendix D, are intended to mitigate specific resource effects. They have been developed either as a result of ongoing research or as a result of

monitoring and evaluation of past similar actions on the White Mountain National Forest and elsewhere. Most information used to develop these additional mitigation measures has been accumulated over the past 15 years of implementing the Forest Plan.

2.1 Description of Alternatives

2.1.1 Alternative 1: No Action Alternative

While this alternative does not meet the Purpose and Need for Action, it does provide a basis for analyzing the effects of conducting no vegetative management activities (No Action) in the Project Area, and comparing these effects with those alternatives that propose some level of vegetative management. This alternative is required by regulations implementing the National Environmental Policy Act (NEPA). This alternative would not harvest any trees, increase permanent wildlife openings, conduct any road or bridge restoration, amend the Forest Plan or implement any other connected actions. This alternative would not meet Forest Plan expectations for sustained timber products and diverse wildlife habitat in HMUs 213 and 214 for the foreseeable future

There would be no change to the existing condition of the area except from natural occurrences, ongoing recreation activities, and road and trail maintenance. This alternative provides a foundation for describing and comparing the magnitude of environmental changes associated with the Action Alternatives against those that occur naturally or during routine operations. This alternative responds to those who want no timber harvesting or active wildlife habitat management to take place. Choosing this alternative would not preclude proposing timber harvest in this area at a later date.

2.1.2 Alternative 2: Original Proposed Action

The Original Proposed Action and its connected actions were developed to optimize the Purpose and Need for Action with the most current information available at that time. It would involve harvesting 1,371 acres by a combination of even-aged and uneven-aged management methods (Table 2). This alternative would provide approximately 5.3 million board feet of sawtimber and pulpwood, and improve future stand quality and productivity. Alternative 2 is displayed in Maps 2A and 2B in Appendix A.

This alternative responds to the need to create uneven-aged stands in hardwoods and mixedwood community types by creating a mixture of tree ages, size classes and species composition. Using clearcutting and seed tree cuts to help accomplish the desired wildlife habitat composition (Table 6), this alternative responds to the need to create early-successional habitat within these HMUs by converting mature northern hardwoods, aspen and paper birch stands to the 1-10 year old age class, and expanding existing wildlife openings.

Table 2. Alternative 2: Proposed Treatments and Acreage

Proposed Treatment	Alt 2
Clearcut & Patchcut	115
• Regeneration Objective (CC)	(105)
• Permanent Wildlife Opening Objective (PWO)	(10)
Seed Tree Cut (STC)	34
Individual Tree and Group Selection (ITS&GS)	905
Commercial Improvement Cut (CIC) and Commercial Thinning (CT)	317
Total Harvest Area	1,371

The operating season for each stand was based on field visits to evaluate roads, site moisture conditions and ecological land types (ELTs) (Tables 7 & 8). Based on ELTs, stands 33/41, 33/42, 34/10, 40/19, 40/19A, 40/19B, 40/19C, 40/102 and 40/102A would be harvested during the winter months (December through March) when the ground is frozen. To minimize exposure to noise and traffic caused by logging activities, stands located near Dolly Copp and Barnes Field campgrounds, and Daniel Webster Trail (34/13, 34/13A, 34/13B and 34/50) would also be harvested in the winter when Dolly Copp campground is closed, and Barnes Field campground and the Daniel Webster trail have their lowest use. The remaining stands can be operated during the summer and fall months between June and October, when soil conditions are dry.

During harvest operations, trees would either be processed in the woods or at the landing site. Tops of trees processed in the woods would remain on the ground. The tops of trees processed at the landing would have to be returned to the harvest site and scattered.

Connected Actions

Approximately 5.3 miles of existing roads (Forest Roads 72, 207, 224, 263, 615 and Josh Brook) and 16 log landings would be restored. Restoration work entails grading roadways, cleaning ditch lines and culverts, and clearing road rights-of-way of limbs and hazard trees. Included in the restoration miles is a ¼-mile route to access stands 40/19, 40/102 and 40/102a. Restoration of this route includes improving the road junction to Route 16, installing culverts and ditches, and widening the existing roadbed. There is concern about stability of the existing cutbanks, where a slump is possible due to slightly plastic silt soils. Upon completion of the Peabody project, restored roads would be closed and stabilized until needed again.

Eighteen small timber stream crossings on the Hayes Copp ski trail would be replaced with metal culverts. Metal culverts require less maintenance and last longer than wooden structures. The larger timber bridge across Culhane Brook would be replaced with a 30-foot metal, temporary bridge. Upon completion of the timber sale, this bridge would be removed and replaced by a smaller timber bridge for cross country skiers.

Once established, the expanded permanent wildlife openings would be maintained every 3-5 years, either by mowing with a tractor or by prescribed burning. For mowing,

openings would first have stumps removed, and then be seeded with winter rye to minimize soil movement as natural herbaceous plants become re-established. Mowing would occur between August and November when site conditions are dry. Prescribed burning would occur in late spring or early fall during appropriate weather conditions.

A Forest Plan Amendment would assign to MA 2.1 approximately 295 acres within HMU 214 that was acquired after 1986 and does not have a management area designation. MA 2.1 guidelines are consistent with surrounding land management objectives and would continue past management practices on these lands.

2.1.3 Alternative 3: Modified Proposed Action

Alternative 3 is a modification of the Original Proposed Action, incorporating changes to resulting from internal concerns and public comments, as well as new information from additional field reconnaissance and analysis. Alternative 3 is displayed in Maps 3A and 3B in Appendix A. **It is the preferred alternative of the Forest Service.**

Changes (Tables 7 & 8) from the Original Proposed Action are:

- Stands 33/58, 33/59 and 41/48 would be deleted from treatment because they are not economically or silviculturally appropriate for harvest at this time. These stands were thinned within the past fifteen years and are composed of moderately stocked, small diameter trees. We could treat these stands at a later time, when a greater percentage of the trees have reached sawtimber size.
- The prescription for a proposed 5-acre patch cut for aspen regeneration within stand 40/19 (40/19c), would be changed to a commercial thinning due to an insufficient number of mature aspen trees in the area.
- To meet visual quality objectives described in the Forest Plan, stand 42/4, a seed tree cut, would be reduced from 20 acres to 13 acres. The seven acres from stand 42/4 would be added to the uneven-aged treatment prescription for stand 42/3.
- To minimize visual effects from Pine Mountain, Howker Ridge and Mount Madison, the prescription for stand 33/4a would change from clearcut to commercial improvement cut and stand 33/5a would be reduced from 15 acres to 10 acres. Stand 33/4a would be incorporated into stand 33/4 and the five acres from stand 33/5a would be added to stand 33/5.
- Stand 33/71 would be reduced from 48 acres to 45 acres to remove areas of low stocking from treatment.
- Stand 40/35, a 48 acre northern hardwood stand, that was included in the North Carter Project scoping letter (1997), would be added. This stand was mistakenly left out of the scoped proposal.

- The permanent wildlife opening in stand 41/34 would be reduced by 1 acre.
- The acreage of stand 34/50 would be decreased from 10 acres to 5 acres due to steep terrain along the southern edge side of the stand.
- The acreage of stand 33/4 would be decreased from 85 acres to 75 acres to avoid wet areas and inoperable terrain.
- Improving access to stands 40/19, 40/102 and 40/102a by constructing a 150-foot temporary road and improving an existing landing off Route 16 at the northern edge of stand 40/19, allows an additional 8 acres of stand 40/102 to be harvested.
- Stands 42/1, 42/3, 42/4, 42/5 & 42/6, in the Rattle River area, would be harvested in winter to protect softwood understory, reduce soil rutting, and avoid logging noise along the Appalachian Trail during summer. Stands 33/4, 33/4a, 33/5, 33/5a and 33/71 would be harvested in winter to reduce dual use on the Pinkham B road by logging trucks and passenger vehicles during summer and fall.

Timber harvesting would occur on approximately 1,248 acres (Table 3) and provide approximately 4.6 million board feet of sawtimber and pulpwood.

Table 3. Alternative 3: Proposed Treatments and Acreage

Proposed Treatment	Alt 3
Clearcut & Patchcut	89
• Regeneration Objective (CC)	(80)
• Permanent Wildlife Opening Objective (PWO)	(9)
Seed Tree Cut (STC)	27
Individual Tree and Group Selection (ITS&GS)	888
Commercial Improvement Cut (CIC) and Commercial Thinning (CT)	244
Total Harvest Area	1,248

Connected Actions

The connected actions would be the similar to Alternative 2, except that a different road access is proposed to stands 40/19, 40/102 and 40/102a. This alternative would address soil stability concerns in accessing these stands by dropping restoration of an existing road on a slump bank, and replacing it with construction of a 150-foot temporary road and a landing within the southern portion of stand 40/102a. The road would be located outside a floodplain and would involve clearing, grubbing and shaping a road template, and installing a 30-foot temporary steel bridge across Imp Brook. A landing would be restored at the north end of stand 40/19. These improvements would be removed upon completion of the timber sale. In addition, 600 feet of classified road (FR 615a) would be restored to access stand 40/18 (reducing skid distance); and ½-mile of road restoration (Josh Brook) would be dropped since access would no longer be required to stand 41/48.

Connected actions for maintenance of the permanent wildlife openings and for the Forest Plan Amendment would be the same as Alternative 2.

Alternative 3 is the preferred alternative of the Forest Service because it meets the Purpose and Need for Action (by improving vigor in some of stands through individual tree harvesting and group selection; helping to meet some of the wildlife habitat composition needs (Table 6) through clearcuts and seed tree cuts; and enhancing growth and regeneration of softwoods on naturally occurring sites); while addressing many internal and public issues (including concerns about soil erosion and visual quality, and assigning 295 acres in HMU 214 to MA 2.1.

2.1.4 Alternative 4: Reduced Even-Aged Management

This alternative addresses concerns with the use of clearcutting by reducing the level of even-aged management from that in Alternatives 2 and 3. Alternative 4 proposes the same stands as Alternative 3, but changes the prescriptions for stands 33/5a, 34/13a, 40/102a, 42/3a and 42/4 from even-aged management to uneven-aged management (Tables 7 & 8). Alternative 4 is displayed in Maps 4A and 4B in Appendix A.

This alternative would harvest 1,248 acres (Table 4) and provide approximately 3.7 million board feet of sawtimber and pulpwood.

Table 4. Alternative 4: Proposed Treatments and Acreage

Proposed Treatment	Alt 3
Clearcut & Patchcut	49
<ul style="list-style-type: none"> • Regeneration Objective (CC) • Permanent Wildlife Opening Objective (PWO) 	(49) (9)
Seed Tree Cut (STC)	14
Individual Tree and Group Selection (ITS&GS)	941
Commercial Improvement Cut (CIC) and Commercial Thinning (CT)	244
Total Harvest Area	1,248

Connected Actions

The connected actions would be the similar to Alternative 3, except that the temporary road providing access to stands 40/19, 40/102 and 40/102a would have a different location. Under this alternative, 300 feet of temporary road and landing would be constructed to the north of the road proposed in Alternative 3. This road would be within a floodplain and would include installing a 20-foot temporary steel bridge across Imp Brook, installing temporary culverts and geo-textile fabric, and placing gravel. These improvements would be removed upon completion of the timber sale. Connected actions for maintenance of the permanent wildlife openings and for the Forest Plan Amendment would be the same as Alternatives 2 and 3.

2.2 Alternatives Considered but Eliminated from Detailed Study

2.2.1 Uneven-aged Management Only

This alternative was considered, but eliminated from study because it does not meet the Purpose and Need for Action as directed by the Forest Plan. One of the goals for MA 2.1 and 3.1 lands is to provide a balanced mix of habitats for all wildlife species. HMUs 213 and 214 have a shortage of early-successional habitat and the Forest Plan identifies the use of even-aged management, primarily through commercial timber harvests using clearcuts or seed tree cuts, to maintain and/or increase this habitat.

2.2.2 Scoped Proposal with Recreation Projects

During the scoping process, a number of issues regarding the proposed recreation projects were raised. Since the issues were specific to the proposed recreation projects, and these recreation projects are not connected to the proposed vegetative management projects, the Deciding Official elected to analyze them in a separate process, with a separate decision or decisions. Once these issues have been addressed, the public will have another opportunity to comment on these projects.

2.2.3 Assigning a Management Area Designation other than MA 2.1 for Undesignated Lands within the Analysis Area

During the scoping process, we received one response that supported assigning undesignated lands to MA 2.1, and one response asking if we had considered any other alternatives. We did not receive any responses suggesting an alternative designation.

The IDT conducted numerous field surveys and site visits with team specialists and other resource professionals to evaluate resources found on the undesignated lands, and did not identify any unique resources which would suggest assigning a MA other than 2.1. A MA 2.1 designation is consistent with past management of these lands, which contain evidence of prior harvesting activities, including skid trails, landings and old tree stumps. It would also be consistent with management areas on surrounding National Forest lands. Past Forest Plan Amendments have emphasized past use and management on surrounding National Forest lands when assigning a designation to newly acquired lands.

The other possible designation that could be assigned to the area based on existing conditions is MA 6.1. This area contains a section of an existing snowmobile trail (Corridor 19) that receives heavy use in the winter as a major corridor connecting New Hampshire and Maine. The DFC within Management Area 6.1 is an emphasis on non-motorized, semi-primitive recreation opportunities within a large expanse of relatively undisturbed landscape, while permitting some motorized use on a seasonal basis only. Lands within this MA are characterized by low interaction between users though evidence of other users is noticeable. The ID team did not feel that the DFC for a MA 6.1 was manageable where snowmobiling is such a prominent existing use of the area.

2.3 Comparison of Alternatives –Actions and Outputs

The following tables display characteristics for each of the alternatives. Table 5 is a summary of comparisons for alternatives (including the measurement indicator mentioned in Section 1.7.1).

Table 5. Summary of Comparisons for Alternatives					
MEASURE	UNIT	ALT 1	ALT 2	ALT 3	ALT 4
PROPOSED HARVEST AREA	Acres	0	1371	1248	1248
• Winter Only Harvest	Acres	0	708	1146	1146
• Summer/Fall Harvest	Acres	0	663	102	102
• Clearcut & Patch Clearcut	Acres	0	115	89	49
○ Regeneration Objective (CC)		0	(105)	(80)	(40)
○ Permanent Wildlife Opening Objective (PWO)		0	(10)	(9)	(9)
• Seed Tree Cut (STC)	Acres	0	34	27	14
• Individual Tree & Group Selection (ITS&GS)	Acres	0	905	888	941
• Commercial Improvement Cut (CIC) and Commercial Thinning (CT)	Acres	0	317	244	244
• Harvest Volume	MBF	0	5320	4575	3715
ESTIMATED STUMPAGE RECEIPTS	\$	0	856,520	752,675	598,115
10% YIELD TAX RECEIPTS (To Towns of Gorham & Shelburne, and Coos County)	\$	0	86,000	75,000	60,000
25% FUND PAYMENTS (To Coos County)	\$	0	214,130	188,169	149,528
ESTIMATED FOREST SERVICE COSTS	\$	55,800	263,940	236,380	211,500
ROAD RESTORATION & TEMPORARY ROAD CONSTRUCTION	Miles	0	5.3	4.8	4.8

Table 6. HMUs 213 and 214 - Comparison of the Acres Needed to Achieve DFC to the Proposed Acres of Accomplishments, by Alternative (Alt).					
HABITAT TYPE	NEED	PROPOSED ACCOMPLISHMENT			
		Alt 1	Alt 2	Alt 3	Alt 4
HMU 213					
Northern Hardwood (regeneration)	40	0	40	20	0
Enhance Spruce/fir component in mixed wood stands	1038	0	250	104	104
Permanent Wildlife Opening	93	0	6	6	6
HMU 214					
Northern Hardwood (regeneration)	119	0	45	45	25
Paper Birch (regeneration)	34	0	34	27	14
Aspen (regeneration)	26	0	20	15	15
Permanent Wildlife Opening	103	0	4	3	3

Table 7. HMU 213 - Stand Prescription & Acreage by Stand for the Action Alternatives.

Rx (Stand Prescription) abbreviations are: CC (Clearcut or Patch Clearcut <10 acres), STC (Seed Tree Cut), ITS (Individual Tree Selection), GS (Group Selection), CIC (Commercial Improvement Cut), CT (Commercial Thinning) and PWO (Permanent Wildlife Openings). Since Group Selection harvests only a percentage of the stand, the actual harvest acres are listed in parentheses.

Compartment	Stand	Alternative 2		Season of Operation	Alternative 3		Season of Operation	Alternative 4		Season of Operation
		Rx	Acres		Rx	Acres		Rx	Acres	
33	4	CIC	85	S(b)/W	CIC	70	W	CIC	70	W
33	4A	CC	15	S(a)/W	CIC	15	W	CIC	15	W
33	5	ITS&GS	38	S(b)/W	ITS&GS	43	W	ITS&GS	38	W
33	5A	CC	15	S(a)/W	CC	10	W	ITS&GS	15	W
33	41	GS	72(12)	W	GS	72(12)	W	GS	72(12)	W
33	42	ITS	35	W	ITS&GS	35	W	ITS&GS	35	W
33	58	ITS&GS	63	S(b)/W	----	----	----	----	----	----
33	59	CIC	78	S(b)/W	----	----	----	----	----	----
33	71	ITS&GS	48	S(b)/W	ITS&GS	45	W	ITS&GS	45	W
34	10	ITS&GS	200	W	ITS&GS	200	W	ITS&GS	200	W
34	13	ITS&GS	154	W	ITS&GS	154	W	ITS&GS	154	W
34	13A	CC	10	W	CC	10	W	ITS&GS	10	W
34	13B	GS	27(8)	W	GS	27(8)	W	GS	27(8)	W
34	50	GS	10(2)	W	GS	5(1)	W	GS	5(1)	W
33	86	PWO	3	S(a)/W	PWO	3	W	PWO	3	W
34	45	PWO	3	W	PWO	3	W	PWO	3	W
			856			692			692	

Season of Operation: S(a) – June 30 through October 15; S(b) – August 1 through October 15; W – December 15 through March 20

Table 8. HMU 214 - Stand Prescription & Acreage by Stand for the Action Alternatives.

Rx (Stand Prescription) abbreviations are: CC (Clearcut or Patch Clearcut <10 acres), STC (Seed Tree Cut), ITS (Individual Tree Selection), GS (Group Selection), CIC (Commercial Improvement Cut), CT (Commercial Thinning) and PWO (Permanent Wildlife Openings). Since Group Selection harvests only a percentage of the stand, the actual harvest acres are listed in parentheses.

Compartment	Stand	Alternative 2		Season of Operation	Alternative 3		Season of Operation	Alternative 4		Season of Operation
		Rx	Acres		Rx	Acres		Rx	Acres	
40	18	CC	10	S(a)/W	CC	10	S(a)/W	CC	10	S(a)/W
40	19	CT	154	W	CT	154	W	CT	154	W
40	19A	CC	5	W	CC	5	W	CC	5	W
40	19B	CC	2	W	CC	2	W	CC	2	W
40	19C	CC	5	W	CT	5	W	CT	5	W
40	35	----	----	----	ITS&GS	49	S(b)/W	ITS&GS	49	S(b)/W
40	35A	CC	4	S(a)/W	CC	4	S(a)/W	CC	4	S(a)/W
40	35B	CC	4	S(a)/W	CC	4	S(a)/W	CC	4	S(a)/W
40	83	ITS	10	S(b)/W	ITS&GS	10	S(b)/W	ITS&GS	10	S(b)/W
40	84	STC	7	S(a)/W	STC	7	S(a)/W	STC	7	S(a)/W
40	102	ITS	21	W	ITS&GS	29	W	ITS&GS	29	W
40	102A	CC	10	W	CC	10	W	ITS&GS	10	W
41	1	CC	15	S(a)/W	CC	15	S(a)	CC	15	S(a)
41	48	ITS&GS	15	S(b)/W	----	----	----	----	----	----
42	1	ITS&GS	27	S(b)/W	ITS&GS	27	W	ITS&GS	27	W
42	3	ITS&GS	24	S(b)/W	ITS&GS	31	W	ITS&GS	24	W
42	3A	CC	10	S(a)/W	CC	10	W	ITS&GS	10	W
42	4	STC	20	S(a)/W	STC	13	W	ITS&GS	20	W
42	5	ITS&GS	31	S(b)/W	ITS&GS	31	W	ITS&GS	31	W
42	5A	STC	7	S(a)/W	STC	7	W	STC	7	W
42	6	ITS&GS	130	S(b)/W	ITS&GS	130	W	ITS&GS	130	W
41	34	PWO	4	S(a)/W	PWO	3	S(a)/W	PWO	3	S(a)/W
			515			556			556	

Season of Operation: S(a) – June 30 through October 15; S(b) – August 1 through October 15; W – December 15 through March 20

CHAPTER 3 - AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This analysis will consider the effects of the project proposal on the following resources: Vegetation; Recreation; Visual Quality Objectives; Roadless/Wilderness Characteristics, Soils (Erosion and Calcium); Water (Quantity & Quality); Fisheries; Wildlife (Habitat, Management Indicator Species, Other Species of Concern, Habitats of Concern); Invasive Plants; Federal Threatened, Endangered, and Proposed Species (TEPS), and Regional Forester Sensitive Species (RFSS); Heritage Resources; and Socio-economics.

Specific issues regarding resources that were raised during the scoping process (see Section 1.7) are addressed in this chapter. Each resource section is organized as follows:

- Issues Related to the Resource
- Description of Affected Environment (Existing Condition)
- Analysis of Direct and Indirect Effects on the Resource (By Alternative)
 - Direct Effects are caused by the action and occur at the same place and time
 - Indirect Effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.
- Analysis of Cumulative Effects on the Resource (By Alternative)
 - Cumulative Effects result from the incremental impact of the action when added to other past, present and reasonably foreseeable actions, regardless of which government agency or individual undertakes such other actions.

3.2 Vegetation

Issues Related to Vegetation:

- Proposed clearcuts in the Project Area should be changed to single tree selection to maintain a closed canopy forest in the area

3.2.1 Affected Environment for Vegetation

Logging has played an important role in the White Mountains since the 19th century and present vegetative conditions are largely the result of this past logging and recent forest management. This section describes the various age classes and condition of vegetation over the landscape, ranging from newly regenerated stands to overmature forests.

The Analysis Area for direct and indirect effects on vegetation is the MA 2.1 and 3.1 lands within HMUs 213 and 214, encompassing 10,154 NF acres. Approximately 86.3% of these lands (8,762 NF acres) comprise a closed-canopy forest of mature and overmature even-aged and uneven-aged stands. The amount of closed and open canopy within MA 2.1 and 3.1 is an indicator of the amount of fragmentation in the forested landscape, and provides a picture of the structural diversity within the Analysis Area.

All of the stands within MAs 2.1 and 3.1 in HMUs 213 and 214 that have been identified for vegetative treatment are overstocked mature northern hardwoods or mixedwood stands containing trees that have low timber quality, are approaching an age where mortality is imminent, or have some damaged component within a stand. According to the *Silvicultural Guide for Northern Hardwood Types in the Northeast* (Leak et al. 1987) and *Silvicultural Guide for Paper Birch in the Northeast (revised)* (Safford 1983) commercially treating these stands would improve the quality and vigor of remaining trees. Existing stand conditions are summarized in Tables 11 and 12.

The Analysis Area for cumulative effects on vegetation encompasses all lands (public and private) within the National Forest proclamation boundary that are adjacent to NF lands in HMUs 213 and 214. The cumulative effects analysis will also consider any significant land use trends within 1 mile of the National Forest proclamation boundary. The cumulative effects time period spans a period that considers activities ten years in the past and ten years in the future (1993 to 2013). Ten years was the time period selected because it represents the length of time after a stand is harvested when it is considered in the regeneration phase of development (i.e. the canopy is not fully closed and sunlight can penetrate the majority of the ground).

Within HMUs 213 and 214, harvesting on National Forest MA 2.1 and 3.1 lands has totaled approximately 428 acres over the past 10 years, or slightly more than 4% of the allowable harvest acres. This included even-aged management on 250 acres that established 54 acres of regeneration (15 acres of clearcuts and 39 acres of final stage overstory removal), and 196 acres in some other stage of development (144 acres of final stage shelterwood cuts, and 52 acres of intermediate stage overstory removal). The understory of the shelterwood stands was already in the young age group (10+ years old) when the final stage cuts were made, while the intermediate stage overstory removal did not take enough basal area to be classified as regeneration. The remaining 178 acres was uneven-aged management (individual tree selection). Monitoring of these stands has shown successful regeneration of hardwood and softwood species at desired stocking levels, with a similar species mix to that found in pre-cut mature forests. Past harvest administration and observations during this analysis indicate that harvesting has not resulted in excessive residual damage to trees within the cutting areas.

In addition to timber harvest, an ice storm in 1998 effectively removed the overstory on 49 acres of hardwoods stands in MA 2.1 and 3.1, and caused mortality among an unspecified number of individual trees throughout portions of HMU 213.

Within the National Forest proclamation boundary, there are approximately 1,694 acres

of private lands directly adjacent to NF lands in HMU 214, and 181 acres of private lands directly adjacent to NF lands in HMU 213. Aerial photos as recent as 1995, show some owners of adjacent private lands conducting management activities similar to those which occur on the National Forest, including timber harvest. Over the past 10 years, an estimated 170 acres of private lands adjacent to HMU 214 have received vegetative treatment. This included group and individual tree selection and commercial thinning on commercial forest land and one parcel of non-commercial forest land. In addition to vegetative management, a 518-acre tract along Stony Brook, adjacent to HMU 214 and about ½-mile northeast of stand 40/84, is being developed for residential housing. At least half of this parcel has already been developed, and the remaining half is being cleared for roads and housing sites.

No significant trends are evident within one mile of the National Forest proclamation boundary where it abuts HMUs 213 and 214. Since 1998, the Town of Gorham conducted individual tree and group selection harvest of storm damaged timber on approximately 1,200 acres; but none of this land is within one mile of the National Forest. Wagner Forest Products manages approximately 2,940 acres of commercial forest land within the Town of Gorham. Some of these lands are within one mile of the National Forest, including one 20-acre parcel that had been clearcut over the past 10 years.

Table 9. Existing Conditions for Stands Eligible for Vegetative Treatment (HMU 213)

Stand	Community Type	Species Mix	Age	Comment
33/4	Northern Hardwood	Sugar Maple, Yellow Birch, Beech	78	Softwood Component
33/5	Northern Hardwood	Sugar Maple, Yellow Birch, Beech	114	Softwood Component
33/41	Softwood	Red Spruce, Balsam Fir	75	
33/42	Northern Hardwood	Sugar Maple, Ash	78	Paper Birch, Aspen Component
33/58	Mixedwood	Low Quality, Small Diameter Hardwoods	75	Harvested in 1975-76
33/59	Mixedwood	Red Spruce, Hemlock with Low Quality, Small Diameter Beech	76	Harvested in 1975-76
33/71	Northern Hardwood	Varied	76	Patch Cut in 1980 & 85
33/86	Wildlife Opening	3-Acre Opening		Within Stand 33/71
34/10	Northern Hardwood	Sugar Maple, Yellow Birch, Beech; Hemlock, Red Spruce along streams	133	Thinned in 1980s
34/13	Northern Hardwood	Sugar Maple, Yellow Birch, Beech; Hemlock, Red Spruce along streams	133	Thinned in 1980s
34/45	Wildlife Opening	3-Acre Opening		Within Stand 34/13
34/13b	Softwood	Red Spruce, Balsam Fir, Hemlock	133	Separated from 34/13 Due to Species Mix
34/50	Northern Hardwood	Varied; SW portion is Softwood	115	Softwood portion proposed for treatment
NOTE: Stands 33/4a, 33/5a and 34/13a are patches separated from larger stands for even-aged mngmt.				

Table 10. Existing Conditions for Stands Eligible for Vegetative Treatment (HMU 214)

Stand	Community Type	Species Mix	Age	Comment
40/18	Northern Hardwood	Sugar Maple, Yellow Birch, Beech; some Hemlock	102	Thinned in early 1980s
40/19	Northern Hardwood	Red Maple, Paper Birch, Ash; some Sugar Maple, Beech & Yellow Birch	78	Stands 40/19a,b,&c are Aspen patches in stand
40/102	Northern Hardwood		78	Separated from 40/19 Due to Species Mix
40/35	Northern Hardwood		118	Stands 40/35a&b are Aspen Patches in stand
40/83	Northern Hardwood	Yellow Birch, Beech; Paper Birch	78	Softwood Component
40/84	Northern Hardwood	Includes 7-acre patch of mature Paper Birch	118	Treatment proposed on Paper Birch patch
41/1	Northern Hardwood	Sugar Maple, Yellow Birch, Beech; Softwood Component	108	Thinned in 1984
41/34	Northern Hardwood	Treatment proposed on wildlife opening only	68	Thinned in 1994
41/48	Northern Hardwood	Sugar Maple, Yellow Birch, Beech; Softwood Component	108	Thinned in 1984
42/1	Mixedwood	White Pine; Patches of Paper Birch, Softwood, Red Maple, Beech	143	Red Oak Seedlings in Understory
42/3	Northern Hardwood	Beech, Paper Birch, Red Maple	143	Low Quality, Stand 42/3a is patch separated for even-aged mngmt.
42/4	Paper Birch		143	Natural Mortality
42/5	Northern Hardwood	Paper Birch, Red Maple; some Yellow Birch, Beech	102	Overstocked
42/5a	Paper Birch			7-acre patch of Paper Birch in Stand 42/5
42/6	Mixedwood	Hemlock, Red Spruce, Balsam Fir, Red Maple, Paper Birch	128	

3.2.2 Direct and Indirect Effects on Vegetation

Summary of Direct & Indirect Effects on Vegetation

Analysis Area	Time Period	Estimated Acres
National Forest lands designated as MA 2.1 and 3.1 in HMUs 213 and 214	Present	Approximately 10,154 NF acres

Alternative	Summary of Direct & Indirect Effects
1	Natural processes continue, No effects from logging or road restoration, No change in age class or structural diversity
2	Even-aged regeneration on 139 acres of hardwoods, aspen and paper birch; Enhanced stand quality and species diversity on 1,222 acres of uneven-aged harvest; Potential for damage to residual trees in uneven-aged harvest areas; Potential for windthrow of residual trees in even-aged harvest areas
3	Same as Alternative 2, with 32 fewer acres of even-aged regeneration and 90 fewer acres of uneven-aged harvest
4	Fewer acres of even-aged harvest than Alternatives 2 & 3 means less shift to early-successional species and less potential for windthrow, more potential for damage to residual trees due to more acres in uneven-aged harvest

Alternative 1: No Action Alternative

There would be no direct effects from timber harvest and road restoration activities, such as openings in the forest canopy, residual tree damage or soil compaction. Any openings in the forest canopy would be the result of natural mortality of standing trees or disturbance (weather event, infestation, etc.). There would be no indirect effects from timber harvest and road restoration activities, such as establishing new stands of regenerating hardwoods, soil erosion or soil calcium loss. Age class and structural (canopy) diversity would remain unchanged.

Alternative 2: Original Proposed Action

Stands with prescriptions for individual tree and group selection harvest (see Tables 7 & 8) would create small patches of ¼- to ½-acre in size to release or regenerate softwood and shade intolerant hardwood species in mixedwood stands. Group selection cuts are the typical harvest method used in mixedwood stands and would harvest approximately 16-20% of the stand. These treatments would maintain an uneven-aged stand leading to greater diversity of age classes and species. Overall, the health and vigor of stands would be improved, resulting in increased growth rates on selected quality sawtimber trees.

Stands 33/58 and 33/59 are even-aged stands with a mature 75-year-old overstory and a younger understory. Commercial improvement and group cuts would remove some of the mature trees and release the understory, promoting growth in the more shade-intolerant species, enhancing vertical structure, and promoting softwood regeneration

Stands with prescriptions for clearcut harvest (CC and PWO treatments in Tables 7 & 8) would create opportunities for early-successional wildlife habitat by removing trees and promoting regeneration or being maintained as openings. Clearcuts would be located in areas of low quality trees to allow the next generation of trees the opportunity to grow at their full potential.

The seed tree cut prescription for stands 40/84, 42/4 and 42/5a would regenerate paper birch by opening the stands but retaining as seed trees some of the mature paper birch that have been declining due to natural mortality.

Alternative 2 would move HMUs 213 and 214 toward their DFC, as well as increase structural and age class diversity. A total of 139 acres of mature forest would be converted to regenerating stands (including 85 acres of northern hardwoods, 20 acres of aspen, and 34 acres of paper birch); maintaining and enhancing this age class habitat component in the HMUs (see Section 2.4, Table 2). Three patch clearcuts would be maintained as permanent wildlife openings totaling 10 acres. Harvest treatments would also promote more softwood regeneration within 250 acres of hardwoods and mixedwood.

Clearcutting northern hardwood stands can promote stump sprouts in species such as ash, maple, birch and basswood. According to a study on four sites in New England, *Whole-tree Clearcutting in New England: Manager's Guide to Impacts on Soils, Streams, and Regeneration* (Pierce et al. 1993), stump sprouting and germination of new seedlings began in the first growing season after harvest. Within five years after cutting, young, dense stands were established on all four sites.

Summer harvesting would only be allowed in clearcuts and seed tree cuts where bark damage would not be an issue since few residual trees would remain. Many herbaceous plants have adapted to surviving in clearcuts or can quickly re-colonize these areas a short time afterwards (Whitman and Hagan 2000). Portions of the understory may also be damaged from repeated passes of logging equipment. To minimize disturbance, pre-existing skid trails would be used as much as possible, and new trails would be laid out prior to operation to reduce the area affected.

Indirect effects include an increased risk of windthrow in the partially cut stands, and to trees adjacent to clearcuts and patch clearcuts. Trees exposed to the wind on wet sites are susceptible to windthrow until crowns expand to fill the canopy and the roots become windfirm. Some residual tree damage would occur from harvesting operations, but skid trails are often planned adjacent to trees marked for removal in order to provide adequate working space for logging equipment.

The wildlife openings would be maintained by mowing or prescribed fire every 3-5 years to discourage growth of woody vegetation and favor herbaceous plant species such as goldenrod and raspberries. Precautions are taken during prescribed burning to prevent residual tree damage along the edge of the opening.

Alternative 3: Modified Proposed Action

Due to additional field review, Alternative 3 was developed as a modification of the Original Proposed Action. The effects of this alternative are nearly the same as Alternative 2 with fewer acres of harvest. The 1,248 acres proposed for harvest include a reduction from Alternative 2 of 90 acres of uneven-aged harvest, 32 acres of even-aged regeneration harvest, and 1 acre of permanent wildlife opening.

Alternative 4: Reduced Even-Aged Management

In response to an issue raised during the scoping process, Alternative 4 reduces even-aged management while allowing for some regeneration and seed tree cuts. A total of 53 acres (including four stands proposed for clearcuts, and one stand proposed for a seed tree cut in Alternatives 2 and 3) would be changed to individual tree and group selection, making this alternative the least responsive to Forest Plan objectives for northern hardwood and paper birch regeneration in HMUs 213 and 214. Residual stand damage would probably be greatest in this alternative since it proposes the most acres of uneven-aged harvest. Potential windthrow would be reduced since there would be fewer openings large enough to trap wind and damage trees along the boundary edge.

3.2.3 Cumulative Effects on Vegetation

Summary of Cumulative Effects on Vegetation		
Analysis Area	Time Period	Estimated Acres
All private and public lands within and adjacent to HMUs 213 & 214, with consideration of significant land use trends within 1 mile of NF boundary	1993-2003 Present 2003-2013	Approximately 29,955 acres of public and private lands

Alternative	Summary of Cumulative Effects
1	Natural processes continue, No effects from logging or road restoration, Continued succession towards mature forest, Loss of species diversity
2	Regeneration due to even-aged harvest and natural disturbance contributes incrementally to fragmentation of closed forest canopy in Analysis Area, but within levels anticipated and analyzed in FEIS for 1986 Forest Plan, Increases early-successional habitat and species, age and structural diversity
3	Similar to Alternative 2, with fewer acres of even-aged harvest
4	Fewer acres of even-aged harvest than Alternatives 2 & 3 means less incremental fragmentation and fewer acres of early-successional habitat

Other than the Proposed Action and its alternatives, the Forest Service does not anticipate any other timber harvest within HMUs 213 and 214 through 2013. As far as the Forest Service has been able to ascertain, the undeveloped portion of the 518-acre Stony Brook residential tract will continue to be cleared or partially cleared for construction of roads and homes. Road rights-of-way have already been harvested and land has been cleared

through commercial thinning operations for site development. The kind of change in the landscape that results from residential development tends to include the introduction of grassy openings, ornamental plants and artificial feeders in a manicured setting, and an increased human influence on surrounding lands. Many residences will maintain openings around the houses and outbuildings that will contribute to edge effect for wildlife, but the grassy habitat typical of a residential lawn would not produce the variety of plants needed to support many wildlife species that require a diverse range of herbaceous and woody vegetation for food and cover. Some of the developed residential lots have retained a small component of mature trees around the boundaries, while others have retained a majority of the existing trees. However, these lots will not contribute to natural stand diversity within the surrounding forest in the same way that even-aged harvest of northern hardwoods, paper birch and aspen generates a variety of young woody vegetation and herbaceous plants that contribute to stand and wildlife habitat diversity.

On lands outside the National Forest proclamation boundary that are within a mile of the Analysis Area, Wagner Forest Products has indicated that they are not planning any additional management activities over the next 5-6 years, and they are considering selling these lands sometime in the future. Wagner manages 2,940 acres of commercial forest lands within the Town of Gorham, both inside and outside the National Forest proclamation boundary. Continued forest management of these lands may contribute incrementally to species, age class and structural diversity of the general forest environment in and around HMUs 213 and 214; but most of the 2,940 acres are managed as uneven-aged stands. One 20-acre stand within one mile of the Forest boundary has been clearcut over the past 10 years. Alternative 2, with the most acres proposed for harvest, still falls short of the DFC for MA 2.1 and 3.1 in HMUs 213 and 214. As a result, even when considering timber harvest and clearing on lands outside the Analysis Area, the Proposed Action and its alternatives are well within the effects anticipated and analyzed in the Final Environmental Impact Statement for the 1986 Forest Plan that provides programmatic direction for timber harvest on the White Mountain National Forest. Should these privately-owned lands currently managed for forest resources be sold for residential development, this could have a more profound and permanent influence on the effects of vegetation management activities on surrounding forest lands.

Alternative 1: No Action Alternative

This alternative will not contribute incrementally to the effects of timber harvest or land clearing within the Analysis Area over the 20-year period from 1993-2013. Without timber harvest now or over the next 10 years; species, age class and structural diversity will remain static or diminish on National Forest lands within HMUs 213 and 214. Diversity may be enhanced by natural disturbance, such as a weather event, fire, disease or an infestation that can create forest openings and provide some limited opportunities for shade intolerant plant species. However, on National Forest lands, regenerating and young stands will age and grow closer to the surrounding canopy. This will have the effect of reducing sunlight to the forest floor and reducing early-successional habitat for wildlife. Mature stands of the short-lived (50-60 years) paper birch and aspen community types will continue to age towards mortality, many to be replaced by shade tolerant species now growing in the understory of these stands.

Action Alternatives 2-4

The three Action Alternatives will contribute incrementally to the effects of timber harvest or land clearing within the Analysis Area over the 20-year period from 1993-2013; however, these effects are well within the effects anticipated and analyzed in the Final Environmental Impact Statement for the 1986 Forest Plan.

The Forest Plan assigns 45% of the lands in MA 2.1 and 3.1 (4,569 acres) in HMUs 213 and 214 to management using both uneven-aged and even-aged silvicultural techniques. The remaining 55% of MA 2.1 and 3.1 (5,585 acres) is managed using predominately uneven-aged treatments. Even-aged harvest has the effect of reducing the acres in closed canopy forest and contributing to fragmentation in the forested landscape. Table 13 compares the cumulative timber harvesting and other stand regenerating activities on MA 2.1 and 3.1 lands, for all of the alternatives.

Table 13. Cumulative Regeneration on NF Lands in HMUs 213 & 214, in acres

Even-aged regeneration harvest is noted in parentheses
(Includes clearcut, seed tree cut, and final stage overstory removal)

Harvest Time Frame	Alt 1	Alt 2	Alt 3	Alt 4
Total NF acres 1993-2003	428 (54)	428 (54)	428 (54)	428 (54)
Total NF acres Proposed Project	0	1371 (139)	1248 (107)	1248 (54)
Total NF acres Anticipated 2003-2013	0	0 (0)	0 (0)	0 (0)
Total NF acres 1993-2013 (% of all MA 2.1 & 3.1)	428 (4 %)	1799 (17%)	1676 (16%)	1676 (16%)
Total NF acres Regeneration Due to Natural Disturbance 1993-2003	(49)	(49)	(49)	(49)
Acres below DFC (473 acres) for Regeneration Habitat in MA 2.1 & 3.1	370	231	263	316
NOTE: 144 acres of even-aged, final-stage shelterwood harvest between 1993 and 2003 released understory growth that was 15+ years old, beyond the regeneration age class.				

Within the time period of 1993 through 2013, Alternative 2 proposes to harvest approximately 1,799 acres, or 17% of the MA 2.1 and 3.1 lands in HMUs 213 and 214. Regeneration resulting from even-aged harvest and natural disturbance during this time period will have reduced the closed forest canopy by 2.5% (252 acres, including new permanent wildlife openings), maintaining 83.8% of MA 2.1 and 3.1 in closed canopy – and the harvested stands will regenerate and grow back into the canopy. This alternative would fall 231 acres short of the DFC for early-successional habitat in HMUs 213 & 214.

Over the 20-year period from 1993 to 2013, Alternative 3 proposes to harvest approximately 1,676 acres, or 16.5% of the MA 2.1 and 3.1 lands in HMUs 213 and 214. Regeneration resulting from even-aged harvest and natural disturbance during this time period will have reduced the closed forest canopy by 219 acres, maintaining 84.1% of MA 2.1 and 3.1 in closed canopy. This alternative would fall 263 acres short of the DFC for early-successional habitat in HMUs 213 & 214.

Over the 20-year period from 1993 to 2013, Alternative 4 proposes to harvest approximately 1,676 acres or 16.5% of the MA 2.1 and 3.1 lands in HMUs 213 and 214; but this will include 50% fewer acres of even-aged harvest than Alternative 3. Regeneration resulting from even-aged harvest and natural disturbance during this time period will have reduced the closed forest canopy by 166 acres, maintaining 84.7% of MA 2.1 and 3.1 in closed canopy. This alternative would fall 316 acres short of the DFC for early-successional habitat in HMUs 213 & 214.

3.3 Recreation

Issues Related to Recreation:

- One respondent was concerned that proposed harvesting activities may increase noise levels to nearby hiking trails.
- One respondent questioned the effects of logging on Daniel Webster trail.
- One respondent questioned the impacts road restoration will have on the Hayes Copp ski trail.

3.3.1 Affected Environment for Recreation

Recreation resources within HMU 213 include several hiking trails, snowmobile trails, a cross country ski trail system, picnic areas and developed campgrounds. Hiking trails such as Ledge, Pine Link, Daniel Webster, Town Line Brook, and Pine Mountain are utilized throughout the year, but busiest during summer and fall. The Bear Springs road (FR 263), Pinkham B road (FR 207), Jacknife road (FR 264), Pine Mountain road (FR 24), and Pine Mountain trail are utilized as snowmobile trails when snow conditions allow, as well as by mountain biking enthusiasts. The Hayes Copp cross country ski trail system is a 9-mile loop that utilizes portions of Dolly Copp Campground road, the Great Gulf Link trail, the Great Gulf trail, and the Culhane Brook road (Forest Road 72).

The Horton Center (private youth church camp), Dolly Copp Campground (167-site Forest Service campground), and Barnes Field Group Campground (12-site Forest Service group campground) are developed recreation sites within HMU 213. The Horton Center and Dolly Copp CG are generally busiest from mid-May through October and closed during the winter. Barnes Field CG is busiest in summer, but is open year-round.

Recreation resources located within HMU 214 include several hiking trails and a major snowmobile corridor trail. Portions of the Rattle River trail, Stony Brook trail and Imp trail lie within the HMU boundaries. The Rattle River trail doubles as a portion of the

Appalachian National Scenic Trail (AT), while the Stony Brook and Imp trails feed into the Appalachian Trail. These trails receive year round use. The Shelburne Snowmobile trail (a portion of New Hampshire State Snowmobile Corridor #19), traverses the northern edge of HMU 214 and abuts proposed harvest units near Rattle River.

The Analysis Area for direct and indirect effects on recreation is the MA 2.1 and 3.1 lands within HMUs 213 and 214, encompassing 10,154 NF acres. Recreation settings for the Peabody Analysis Area are described by the Recreation Opportunity Spectrum (ROS). ROS defines a range of unique recreation experiences as: Primitive, Semi-Primitive Nonmotorized, Semi-Primitive Motorized, Roaded Natural and Rural (Forest Plan, pp VI-9). All of the proposed harvest units are associated with a ROS classification of "Semi-Primitive Motorized" (predominately natural appearing environment with evidence of human users) in MA 3.1, and "Roaded Natural" (predominately natural appearing environment with moderate evidence of human activity) in MA 2.1. The recreation experiences associated with these classifications allow evidence of motorized use, human activity and resource utilization associated with timber harvest (Forest Plan, pages III-34 & III-40). Timber harvest has occurred in the Project Area in the past, so the recreation experience is not expected to change.

The Analysis Area for cumulative effects on recreation will include all public and private lands within HMUs 213 and 214. The cumulative effects time period would span a period of ten years in the past to ten years into the future, which is the same as for vegetation, since any effects to recreation are a direct result of activities associated with the proposed vegetation management.

3.3.2 Direct and Indirect Effects on Recreation

Summary of Direct & Indirect Effects on Recreation

Analysis Area	Time Period	Estimated Acres
National Forest lands designated as MA 2.1 and 3.1 in HMUs 213 and 214	Present	Approximately 10,154 NF acres

Alternative	Summary of Direct & Indirect Effects
1	Forest landscape and recreation experience unaltered by logging or road restoration, No improvements to Culhane Brook road (Hayes Copp x-c trail)
2	Changes to forest landscape along certain Forest roads and trails, Increased noise and traffic associated with logging and road restoration, Improvements to Hayes Copp x-c trail, Interrupted access to Hayes Copp x-c trail and to snowmobile use of Pinkham B and Bear Springs roads
3	Similar to Alternative 2, Limitation to winter harvest in HMU 213 will reduce effects of noise and traffic from logging activities during peak recreation season, Dropped units will reduce effects on Bear Springs road
4	Similar to Alternative 3, Reduced hunting opportunities in early-successional habitat

Alternative 1: No Action Alternative

Alternative 1 would not alter current recreation opportunities. The vegetative landscape along Forest roads within the Project Area would remain unaltered by logging activity. Peabody Brook road (FR 224) and Imp road (FR 615) would not be opened. Road and trail maintenance would occur at regularly scheduled intervals. Use of the Hayes Copp, Shelburne, and Daniel Webster trails would continue uninterrupted, other than for normal maintenance. The Culhane Brook Bridge and the 18 substandard stream crossings on the Culhane Brook road would remain in place until replacement funds came available.

Alternative 2: Original Proposed Action

This alternative would have more short-term, direct and indirect effects to recreation use of local hiking trails, snowmobile trails, cross country ski trails and Forest roads than any of the alternatives. These effects may be experienced by hikers, campers, hunters and others who attempt to recreate near the sights and sounds of harvest activities. Harvest activities may occur during peak summer recreation and fall foliage viewing periods.

Most of the proposed harvest units border or are within a mile of a major state highway (State Route 2 and State Route 16) or state maintained road (Pinkham B road). Vehicular highway traffic noise can generally be heard from all locations within the Analysis Area. The addition of logging associated activities and heavy truck traffic will add to the noise levels and traffic load of the surrounding area. Noise levels will be loudest at the lower trail elevations but will diminish as hikers continue beyond the harvest operations. Hikers climbing the surrounding peaks will hear background noise from the harvest operation in the valley below.

A portion of the Daniel Webster trail lies within a proposed harvest unit. The first 0.6 miles of the trail passes through harvest unit 34/13 and 34/13b, and activities would be visible along the route. Hikers may be affected by harvest activities adjacent to the trail and by equipment skidding logs across the trail. To minimize potential effects from logging activities, these units would be harvested in winter when trail use is lowest.

The Culhane Brook road was originally built as a truck road, but has been utilized as an integral part of the Hayes Copp cross country ski trail system since 1988. Alternative 2 proposes to harvest three units (34/10, 34/13 and 34/13b) along the road, requiring the restoration of 1.1 miles of roadway to accommodate log trucks. To maintain a safe work and recreation environment, portions of the Culhane Brook road would be closed to cross country skiers and snowshoers when harvesting and hauling operations are active.

The restoration of the Culhane Brook road would provide the opportunity to enhance the Hayes Copp Cross country ski trail system by replacing the Culhane Brook bridge with one that meets Forest Service standards and will safely accommodate equipment used to mow existing ski trails in the summer and pack the ski trails in the winter. In addition, Alternative 2 proposes to replace 18 existing trail bridges with culverts that would safely accommodate equipment used to mow and pack existing ski trails.

Snowmobile users may be affected by harvesting on the Pinkham B and Bear Springs roads. Since dual use of these roads may be unavoidable, mitigation measures affecting times of operation (Appendix D) would have to be followed to provide safeguards for snowmobile riders and loggers during harvesting of stands 33/4 and 33/5 along the Pinkham B road, and stands 33/58, 33/59, 33/41 and 33/42 along the Bear Springs road.

The Shelburne snowmobile trail (Corridor 19) is located on the southern edge of stands 42/3 and 42/4, but logging activities should not effect snowmobile use since the trail is outside the proposed harvest boundary. Logging slash would be pulled away from the snowmobile trail to reduce hazards to riders and improve site distance along the trail. Harvesting activity would be visible from the snowmobile trail. Safety hazard signs would be erected on snowmobile trails to warn of logging activities.

Under this alternative, there would be no effect to Dolly Copp campground since it is closed in the winter and the units in this area would be harvested during this time. Use at Barnes Field Campground is generally low during the winter months so effects would be limited to a fewer number of users compared to summer. Signs would be posted on the Pinkham B road warning of logging and hauling activities.

Stands 42/4 and 42/6 are within a half-mile of the Rattle River trail (Appalachian Trail). Visual effects of harvest activities would be mitigated by adjusting harvest boundaries during leaf-off season. However, the sounds of harvest activity would be heard. Winter harvesting of these stands will eliminate disturbances during peak hiking season.

This alternative would establish early-successional forest stands and expanded wildlife openings that would provide habitat and browse for certain bird and game species. Bird dog enthusiasts that use these areas would benefit by having greater opportunities to flush ruffed grouse from newly established forest openings.

Alternative 3: Modified Proposed Action

Alternative 3 would have effects similar to Alternative 2. It differs in that all timber harvest in HMU 213 would occur in winter, outside the peak recreation period. This will not change effects to snowmobiling on Pinkham B or Bear Springs roads, or to Hayes Copp x-c ski trail. This alternative also drops units 33/58 and 33/59 from the harvest schedule, reducing the effects to winter snowmobile use of the Bear Springs road.

Alternative 4: Reduced Even-Aged Management

Alternative 4 would have effects similar to Alternative 3. It differs in that fewer acres of early-successional forest would be established, diminishing habitat and browse for some bird and game species. Bird dog enthusiasts would have fewer opportunities to flush ruffed grouse from newly created openings.

3.3.3 Cumulative Effects on Recreation

Summary of Cumulative Effects on Recreation		
Analysis Area	Time Period	Estimated Acres
All private and public lands within and adjacent to HMUs 213 & 214	1993-2003 Present 2003-2013	Approximately 29,955 acres of public and private lands
Alternative	Summary of Cumulative Effects	
1	Forest landscape and recreation experience unaltered by logging or road restoration, Adjacent residential development may impact recreation resources	
2	Changes to forest landscape along certain Forest roads and trails, Short term effects on recreation experience due to logging and road restoration activities, No long-term cumulative effects anticipated as a result of project proposal	
3	Similar to Alternative 2, fewer acres of logging, less road restoration	
4	Similar to Alternative 3	

None of the alternatives considered in detail in this document would change the recreation opportunities identified in the Forest Plan for the Project Area. When normal mitigation measures are employed, recreation activities and timber harvesting have co-existed, and can continue to co-exist without long-term effects on recreation opportunities. One example is the Hayes Copp ski trail system, which was developed from roads originally built for hauling timber. Short-term effects from noise and traffic generated by harvest operations do not persist once operations are completed. Over the next 10 years no additional timber harvest is anticipated on public or private lands within the HMUs, so no cumulative impacts from logging activity are expected. The Forest Service is considering development of a mountain biking trail system, a hiking trail relocation and a new parking lot within HMU 213 in the near future. Expansion of the Stony Brook residential development may increase use on neighboring Forest Service roads and trails (such as Stony Brook and Imp trails) and in unplanned user-developed trails connecting private lands to Forest Service recreation facilities.

3.4 Visual Quality Objectives

Issues Related to Visual Quality Objectives:

- Ensure that Visual Quality Objectives (VQOs) are met for the Pine Mountain, Presidential Range and Appalachian Trail viewsheds.

3.4.1 Affected Environment for Visual Quality Objectives

The Project Area lies within the lower- to mid-mountain slopes ranging in elevation from 800 ft. to 2400 ft. The landscape is characterized by a large expanse of hardwoods with lesser amounts of softwoods situated along streams and upper-mountain slopes. There

are a variety of textures visible on the hardwood-dominated slopes resulting largely from past harvest and land clearing activities.

All areas within the Forest have been inventoried and assigned Visual Quality Objectives (Forest Plan VII-I-2) based on guidelines established by the Forest Plan to evaluate planned changes to scenery. The Visual Quality Objectives (VQO) established for the proposed Project Area are Retention (management activities are not evident to the casual forest visitor) and Partial Retention (management activities may be evident but subordinate to the characteristic landscape). The VQO also establishes distance zones for foreground views (0-1/2 mile), middle ground (1/4 to 3-5 miles from viewer) and background (3 to 5 miles to infinity from viewer).

The majority of the Project Area is mapped as Variety Class B (Common, features contain variety, but tend to be common and are not outstanding by visual quality); although the Peabody River valley, a portion of the Bear Springs stream valley, the Appalachian Trail within the Rattle River watershed, and a portion of Route 2 east of Gorham are mapped as Variety Class C (Minimal, features with little variety by themselves or in combination). The Project Area has a Sensitivity Level Rating of 1 (Highest, based on the high number of viewers to the view corridor/viewshed).

Eleven viewpoints were analyzed for HMUs 213 and 214: Crescent Mountain, Mt. Madison, Howker Ridge trail, Pine Mountain, Pine Link trail vista, Gorham Common, Route 16 straightaway north of the Peabody River, Rattle River trail, Appalachian Trail going up to Mount Hayes, Appalachian Trail east of Mt. Moriah and Middle Mountain. These viewpoints comprise the **Analysis Area for direct and indirect effects on visual quality**, and are displayed on Map 1A (Appendix A). From these vantage points, there is evidence of past clearcuts on the Forest and private land in the form of large crown openings from clearcuts, strip cuts, smaller openings from patch cuts and land clearing, and texture variations from shelterwood cuts and thinnings.

Of these eleven viewpoints, four locations offer the most encompassing views of the Project Area. These viewpoints include Crescent Mountain, the Ledges on the top of Pine Mountain, Mount Madison and the Appalachian Trail going up to Mount Hayes.

Crescent Mountain Viewpoint: The views from Crescent Mountain take in the town of Randolph and Route 2 all the way to the National Forest, over 3 miles away. Private property developed for homes, roads and agriculture are intermixed with forests of varying age classes. There are no visible openings from past harvesting. Lands visible within the Forest boundary are predominately mature hardwoods, mixed with softwoods on the ridges and along streams.

Pine Mountain Viewpoint: Most of the Project Area can be seen from multiple viewpoints on Pine Mountain, with the exception of stands located off of Route 2, west of Gorham. Looking southeast across the Peabody River valley, past management practices both on National Forest lands and private lands can be seen very clearly. Most of the landscape is mature hardwood forest with softwoods at higher elevations and along stream. Past clearcuts on private lands are barely noticeable due to the size of advanced regeneration and coloration which blend into the surrounding forest. Visual differences in the canopy heights can be seen in silhouette along the ridges. Looking to the Stony

Brook residential area, roads have been constructed approximately half mile up the mountain slope to the Forest Service boundary. Small openings for house lots are interspersed throughout the developed portion of the area. Recently, development has expanded to the south in the form of road clearing and timber harvest which is visible on the landscape due to the wide spacing of trees. Looking to the east toward Randolph (Route 2 east), a 7-acre opening from a harvest unit completed in 1997 is visible on the landscape.

Mount Madison Viewpoint: The views from Mount Madison are very similar to those seen from Pine Mountain.

Appalachian Trail up to Mt. Hayes Viewpoint: Lands viewed from this viewpoint are predominately mature hardwood stands interspersed with softwoods. Past harvesting on Forest land is not visible from this viewpoint, though uneven-aged management on private lands adjacent to the Forest has created some textural variation in the canopy.

The Analysis Area for cumulative effects on visual quality includes the 31,500-acre Peabody River watershed, the 5,820-acre Pea Brook watershed, and the 2,850-acre Rattle River watershed. These watersheds encompass the viewpoints and viewsheds from which the Project Area can be seen, and the greater landscape in which the projects may have a visual impact. Cumulative effects analysis will encompass past, present and future activities spanning the 20-year period from 1993 to 2013.

3.4.2 Direct and Indirect Effects on Visual Quality Objectives

Summary of Direct & Indirect Effects on Visual Quality Objectives

Analysis Area	Time Period	Estimated Acres
Eleven (11) primary view points from which the Project Area can be seen	Present	N/A

Alternative	Summary of Direct & Indirect Effects
1	Forest landscape and visual quality unaltered by logging or road restoration,
2	15 regeneration cuts & 1 wildlife opening are visible from 7 of the primary viewpoints, One clearcut (stand 42/14) exceeds Forest Plan VQO limits for size of opening visible from viewpoint, All other openings meet VQO limits
3	13 regeneration cuts & 1 wildlife opening are visible from 6 of the primary viewpoints, Stand 42/14 reduced in size to meet Forest Plan VQO limits, All other openings meet VQO limits
4	8 regeneration cuts & 1 wildlife opening are visible from 6 of the primary viewpoints, All openings meet VQO limits

Alternative 1: No Action Alternative

Alternative 1 would not make any immediate changes to the existing landscape, nor would it have any direct effects on visual quality on National Forest land. Over time, the landscape will change through natural mortality and disturbance (i.e. ice or wind storms).

Action Alternatives 2-4

The direct impacts of even-aged and uneven-aged management would result in short-term textural changes in the existing tree canopy as seen from the primary viewpoints. Even-aged management offers more textural change than uneven-aged management. The size, position, and design of clearcuts may possibly have some short-term direct effects on visual aesthetics, but these can be minimized by scattering the openings across the landscape, creating irregular shaped units and feathering the edges, and leaving groups of reserve and wildlife trees throughout the area. The proposed clearcuts will be distinctly visible from some viewpoints; but, since there are existing clearcuts already visible from many of the viewpoints, they would not represent a dramatic change to the landscape.

Single tree and small group selection treatments in uneven-aged stands would result in removal of 1/4 to 1/3 of the basal area. The stands would continue to appear natural, and would regain foliar density within a few years as forest floor vegetation grows back and tree canopies increase in size due to the added sunlight. In some instances, uneven-aged management may enhance visual quality by extending the view into the stand. When analyzed at a broader level, vegetative changes resulting from even-aged and uneven-aged management blend into the existing textural diversity and human-related development in the surrounding landscape.

Based on the Forest Plan Visual Quality Guidelines, Table 14 displays the maximum number of acres that may be observed from a viewpoint for any one opening, either from a stationary observation or a vehicle oriented observation.

Table 14. Allowable Observed Acres of Individual Openings
(Forest Plan Visual Quality Guidelines, observed from designated viewpoint)

VQO	Distance Zone	Stationary Observation (Acres)	Vehicle Observation (Acres)
Partial Retention	Middleground	10	15
Partial Retention	Background	15	25
Retention	Foreground	1	3

Table 15 displays the visual impacts for units seen from the eleven viewpoints for each of the action alternatives. The corresponding Visual Quality Objective (VQO) for each viewpoint, as outlined in the Forest Plan, is also displayed. The acres seen from each viewpoint listed in the table are generated from a computerized visual analysis model and confirmed with on-site visits and photos. By designing irregularly shaped units and conforming to the topography, the Forest Service is able to minimize visual impacts while still optimizing wildlife habitat needs.

Table 15. Visibility of Clearcuts, Seed Tree Cuts and Patchcuts from Established Viewpoints, compared for Action Alternatives 2-4:
Viewpoint: Foreground (FG), Middleground (MG), Background (BG),
Visual Quality Objective: Retention (R), Partial Retention (PR).

Viewpoints	Distance Zone	Visible Units	VQO	Acres Visible as Clearcut or Patchcut (NC – No Clearcut)		
				Alt 2	Alt 3	Alt 4
Crescent Mountain	BG	Unit 33/4A	PR	5.7	0.0	NC
	BG	Unit 33/5A	PR	6.3	4.0	NC
	BG	Unit 40/18	PR	4.2	4.2	4.2
Howker Ridge	MG	Unit 33/4A	PR	6.0	0.0	NC
	MG	Unit 33/5A	PR	0.0	0.0	NC
	MG	Unit 34/13A	PR	0.0	0.0	NC
	BG	Unit 40/18	PR	0.0	0.0	NC
	MG	Unit 40/19A	PR	0.0	0.0	0.0
	MG	Unit 40/19B	PR	0.0	0.0	0.0
	MG	Unit 40/19C	PR	0.0	0.0	0.0
	BG	Unit 40/35A	PR	0.0	0.0	0.0
	BG	Unit 40/35B	PR	0.0	0.0	0.0
	BG	Unit 40/84	PR	0.0	0.0	0.0
	MG	Unit 40/102A	PR	0.0	0.0	NC
Mt Madison	MG	Unit 33/4A	PR	3.2	0.0	NC
	MG	Unit 33/5A	PR	0.0	0.0	NC
	MG	Unit 33/86	PR	0.0	0.0	NC
	BG	Unit 34/13A	PR	0.0	0.0	NC
	BG	Unit 40/18	PR	6.7	6.7	6.7
	BG	Unit 40/19A	PR	4.5	4.5	4.5
	BG	Unit 40/19B	PR	0.0	0.0	0.0
	BG	Unit 40/19C	PR	5.0	NC	NC
	BG	Unit 40/35A	PR	3.2	3.2	3.2
	BG	Unit 40/35B	PR	0.0	0.0	0.0
	MG	Unit 40/84	PR	4.9	4.9	4.9
	MG	Unit 40/102A	PR	7.4	7.4	NC
Pine Mountain	MG	Unit 33/4A	PR	10.0	NC	NC
	MG	Unit 33/5A	PR	10.0	8.6	NC
	MG	Unit 34/13A	PR	7.5	7.5	NC
	MG	Unit 40/18	PR	8.0	8.0	8.0
	MG	Unit 40/19A	PR	3.0	3.0	3.0
	MG	Unit 40/19B	PR	0.8	0.8	0.8
	MG	Unit 40/19C	PR	4.1	NC	NC
	MG	Unit 40/35A	PR	3.2	3.2	3.2
	MG	Unit 40/35B	PR	0.6	0.6	0.6
	MG	Unit 40/84	PR	3.7	3.7	3.7
	MG	Unit 40/102A	PR	3.5	3.5	NC

Table 15. Continued

Viewpoint: Foreground (FG), Middleground (MG), Background (BG),
 Visual Quality Objective: Retention (R), Partial Retention (PR).

Viewpoints	Distance Zone	Visible Units	VQO	Acres Visible as Clearcut or Patchcut (NC – No Clearcut)		
				Alt 2	Alt 3	Alt 4
Pine Link Vista	MG	Unit 33/86	PR	0.0	0.0	0.0
	MG	Unit 40/18	PR	3.6	3.6	3.6
	MG	Unit 40/19A	PR	1.3	1.3	1.3
	MG	Unit 40/19B	PR	0.0	0.0	0.0
	MG	Unit 40/35A	PR	1.1	1.1	1.1
	MG	Unit 40/35B	PR	0.0	0.0	0.0
	MG	Unit 40/84	PR	3.2	3.2	3.2
	MG	Unit 40/102A	PR	0.0	0.0	NC
Route 16 Straight-away	MG	Unit 40/18	PR	0.0	0.0	0.0
	MG	Unit 40/19A	PR	0.0	0.0	0.0
	MG	Unit 40/19B	PR	0.0	0.0	0.0
	MG	Unit 40/19C	PR	0.0	NC	NC
	MG	Unit 40/35A	PR	0.0	0.0	0.0
	MG	Unit 40/35B	PR	0.0	0.0	0.0
	MG	Unit 40/84	PR	0.0	0.0	0.0
A.T. East of Mount Moriah	MG	Unit 33/86	PR	0.0	0.0	0.0
	MG	Unit 34/13A	PR	0.0	0.0	NC
	MG	Unit 40/18	PR	0.0	0.0	0.0
	MG	Unit 40/19A	PR	0.0	0.0	0.0
	MG	Unit 40/19B	PR	0.0	0.0	0.0
	MG	Unit 40/19C	PR	0.0	NC	NC
	MG	Unit 40/35A	PR	0.0	0.0	0.0
	MG	Unit 40/35B	PR	0.0	0.0	0.0
	MG	Unit 40/84	PR	0.0	0.0	0.0
A.T. to Mount Hayes	MG	Unit 41/1	PR	9.8	9.8	9.8
	MG	Unit 42/3A	PR	1.8	1.8	NC
	MG	Unit 42/4	PR	12.9	8.4	NC
	MG	Unit 42/5A	PR	4.8	4.8	4.8
	MG	Unit 41/34	PR	0.2	0.2	0.2
Middle Mountain	MG	Unit 42/5A	PR	4.4	4.4	4.4
Rattle River Trail	FG	Unit 42/3A	R	0.0	0.0	0.0
	FG	Unit 42/4	R	0.0	0.0	0.0
Gorham Commons	MG	Unit 40/18	PR	0.0	0.0	0.0
	MG	Unit 40/35B	PR	0.0	0.0	0.0

Table 16 compares, for each of the action alternatives, the number of clearcuts, and the acres of openings visible from the four view points with the most encompassing vistas of the Project Area.

Table 16. Visibility of Clearcuts and Acres of Openings from Certain Viewpoints, Compared for Action Alternatives 2-4

View Point	Visible From View Point	Alt 2	Alt 3	Alt 4
Crescent Mountain	Clearcuts	3	2	1
	Acres of Openings	16.2	8.2	4.2
Pine Mountain Ledges	Clearcuts	11	9	6
	Acres of Openings	54.4	38.9	19.3
Mt. Madison	Clearcuts	7	5	4
	Acres of Openings	34.9	26.7	19.3
Appalachian Trail to Mt. Hayes	Clearcuts	4	4	2
	Acres of Openings	29.5	25.0	14.8

Alternative 2: Original Proposed Action

With Alternative 2, openings would be visible from Crescent Mountain, Howker Ridge, Mount Madison, Pine Mountain, Pine Link, Appalachian Trail to Mount Hayes and Middle Mountain, and all but one opening (42/4) would be within the acceptable limits outlined in the Forest Plan.

Fourteen of the fifteen stands proposed for even-aged management would meet the Visual Quality Objectives for all analyzed viewpoints as outlined in the Forest Plan (Table 12). When stand 42/4 is seen from Viewpoint H (Appalachian Trail to Mt. Hayes), 12.9 acres is visible, and this is more than the visible acreage allowed by the Forest Plan VQOs. Stand 42/4 is a seed tree cut and at least 4 trees per acre would be retained as a seed source. To ensure that stand 42/4 would not be visible from the adjacent portion of the Appalachian Trail, the boundaries for this harvest unit would be adjusted during the leaf-off period to screen it from the AT.

Harvesting activities within stands 33/4, 33/5, 33/71, 34/10, 34/13, 34/13A, 42/4 and 42/3 would be visible in the foreground from the Pinkham B road, the Bear Springs snowmobile trail, the Hayes Copp ski trail, Daniel Webster trail and Corridor 19 snowmobile trail. To minimize visual impacts, slash would be removed 50 feet from the road and trail and reserve trees in clearcut units would be strategically placed to reduce the amount of opening visible. Within uneven-aged managed stands, any noticeably damaged small trees would be removed to minimize the visible evidence of the harvest.

Harvesting of stands in the Rattle River area would require an approximately $\frac{3}{4}$ -acre landing to be constructed just off of Route 2, on the northern edge of stand 41/5. To harvest stands 33/4 and 33/5 along the Pinkham B road, two approximately $\frac{3}{4}$ -acre landings would also be constructed. Though these landings would be visible to motorists driving along the roads, they would meet the allowable acres visible for a VQO of

Retention (3 acres). If safety standards allow, a strip of trees would be left along the roadways to decrease visibility into the harvest sites. Currently saplings hide the entrance of the spur road leading to stand 40/19, making it unnoticeable to motorists driving on Route 16. To restore this road, the saplings would be removed and the lower portion of the road would be visible to motorists driving south on Route 16. Even if the entire roadway was visible (approximately 1,500 feet) from Route 16, it would amount to an approximately ½-acre opening, which is within the 3-acre limit for a Retention VQO.

Alternative 3: Modified Proposed Action

Alternative 3 is similar to Alternative 2, with several exceptions. For Alternative 3, stands 33/4a and 40/19c would be changed from even-aged to uneven-aged management and stand 33/5a would be reduced to ten acres, making these stands less visible on the landscape. As a result, there would be no new openings visible from the Howker Ridge viewpoint. And the acres viewed as openings from Crescent Mountain, Pine Mountain and Mount Madison would be reduced.

Stand 42/4 would be reduced from 20 acres to 13 acres. This has the effect of reducing the visible acres seen from the Appalachian Trail going up to Mount Hayes from 12.9 to 8.4 acres, making this viewpoint compliant with Forest Plan VQO limits.

An additional landing to those listed for Alternative 2 would be required for Alternative 3. This ½- to ¾-acre landing would be constructed off of Route 16, on the northwest side of stand 40/19. This landing would be visible to motorists driving along Route 16, but it would still fall within the 3-acre limit for a Retention VQO. If safety standards allow, a strip of red pine would be left along the highway to decrease the view into the harvest site. The entrance and some portion of a temporary road needed to access stands 40/102 and 40/102a would be visible to motorists driving on Route 16. This temporary road would be approximately 150 feet in length; and, even if the entire 150-foot roadway was visible from Route 16, it would amount to an approximately ¼-acre opening, which is within the 3-acre limit for a Retention VQO.

In addition to the mitigation measures listed in Alternative 2 for reducing visual impacts from even-aged management practices, changing the season of operation for stands within the Rattle River area and along Pinkham B road to winter would reduce the likelihood that harvest activities would occur while visitor use is high.

Alternative 4: Reduced Even-Aged Management

Alternative 4 offers the least amount of visible disturbance within the tree canopy, while still achieving some of the Forest Plan goals and objectives for creating early-successional habitat. Stands 33/4a, 33/5a, 34/13a, 40/102a, 42/3a and 42/4 would be changed from even-aged management to uneven-aged management, effectively reducing the number of openings seen from the viewpoints

The openings created by landings along Route 2, Route 16 and the Pinkham B road would have the same effects as those listed in Alternatives 2 and 3. Alternative 4 proposes a longer temporary road (300 feet) to access stands 40/102 and 40/102a than

Alternative 3, but the entire road would still be less than a ¼-acre opening, which is within the 3-acre limit for a Retention VQO.

3.4.3 Cumulative Effects on Visual Quality Objectives

Summary of Cumulative Effects on Visual Quality Objectives		
Analysis Area	Time Period	Estimated Acres
Peabody 5 th -level watershed, Rattle River and Pea Brook 6 th -level watersheds	1993-2003 Present 2003-2013	Approximately 40,200 acres of private and public lands

Alternative	Summary of Cumulative Effects
1	No increase in openings resulting from clearcutting on National Forest lands would be visible on the landscape
2	Clearcutting on National Forest lands will contribute to existing evidence of land clearing within the Analysis Area and result in an incremental increase in openings visible on the landscape. Land clearing will continue on private residential development near Stony Creek. No additional harvesting anticipated on private or public lands. Cumulative visual effects of openings are within those anticipated and analyzed in the FEIS for the 1986 Forest Plan.
3	Similar to Alternative 2, with fewer openings
4	Similar to Alternative 3, with 50% fewer openings

Evidence of previous harvesting is visible across the landscape, both on the National Forest and on lands in other ownership. Past actions most likely resulted from natural disturbances, timber management, landing clearing for residential housing development and road construction. Within the Analysis Area, approximately 428 acres have been harvested within the last ten years. This includes 15 acres in clearcuts intended to establish early-successional habitat, and 144 acres of final-stage shelterwood cuts that are not openings, but will appear as a difference in texture on the landscape. An additional 49 acres affected by the 1998 ice storm appear as openings on the landscape.

All of the action alternatives propose some level of clearcutting. In most cases, only small areas of the proposed clearcuts would be visible from any viewpoint and all stands meet the Forest Plan standards and guidelines for visual quality (with the exception of stand 42/4 in Alternative 2). The shapes and sizes of the proposed stands have been designed to blend into the landscape and create a mosaic pattern of differing textures and openings within the canopy. No additional harvesting is planned in this area for the next ten years, so cumulative impacts to visual resources are expected to be well within the scope of those described in the Forest Plan.

3.5 Roadless/Wilderness Character

No Issues Related to Roadless/Wilderness Character

3.5.1 Affected Environment for Roadless/Wilderness Character

As part of the Forest Planning process, the White Mountain National Forest is required by law to conduct an inventory of lands within the National Forest that qualify as “roadless”, and then to evaluate and consider these lands for recommendation as potential Wilderness areas.

1986 Forest Plan Roadless Areas

For the 1986 Forest Plan, 17 Roadless Areas totaling about 353,000 acres were inventoried on the White Mountain National Forest. From that inventory, the Forest Service recommended, and Congress approved the 12,000-acre Caribou-Speckled Wilderness. The White Mountain National Forest currently has 5 congressionally-designated Wilderness areas, totaling 114,000 acres. The remaining 16 Roadless Areas inventoried in the 1986 Forest Plan were assigned to a variety of Management Areas. Two of these Roadless Areas, Wild River and the Great Gulf Extension, are adjacent to the Peabody Project Area but are not directly impacted by any of the proposed harvest units. Maps of these Roadless Areas are available in the Project Planning Record.

In January 2001, President Clinton approved new rules for managing Roadless Areas. Referred to as the Roadless Area Conservation Rule, this new direction would have applied to the 16 Roadless Areas inventoried in the 1986 Forest Plan, providing greater protection of these Roadless Areas than some of the Management Area prescriptions assigned by 1986 Forest Plan. To date, the Rule has not been formally implemented. However, the Forest Service is following temporary direction to protect these areas by requiring that the Chief of the Forest Service approve any new road construction or timber harvest within the boundaries of the Roadless Areas covered by the new rules. The Peabody project would not propose any road construction or timber harvest within any Roadless Area covered by the Roadless Area Conservation Rule.

Forest Plan Revision – New Roadless Area Inventory

For the ongoing Forest Plan Revision, the White Mountain National Forest has completed a new Roadless Area Inventory. This inventory reconsiders all lands on the National Forest for their Roadless Area potential, accounting for new land acquisitions, changes to the landscape since the last Forest Plan, and improved computer technology for evaluating areas. The new inventory includes 17 Roadless Areas totaling nearly 508,000 acres (including 114,000 acres of Wilderness). The new inventory does not change the boundaries of the Great Gulf Extension Roadless Area; but it does expand the Wild River Roadless Area. A portion of the Peabody Project Area falls within the boundaries of the new Wild River Roadless Area, including stands 40/18, 40/19, 40/19a, 40/19b, 40/19c,

40/35, 40/35a, 40/35b, 40/83, 40/84, 40/102, 40/102a, 41/1, 41/34 and 41/48. A map of the new Roadless Area Inventory, including the Wild River Roadless Area, is available in the Project Planning Record.

The nearest congressionally-designated Wilderness Area to the Peabody Project Area is the Great Gulf Wilderness which is located about 1.5 miles from the nearest proposed harvest unit (34/13).

Roadless Characteristics

Roadless characteristics are quantitative and objective, and they determine whether an area may be considered for recommendation as Wilderness. The Forest Plan Revision Roadless Area Inventory applied roadless criteria to the White Mountain National Forest to determine which areas qualified for consideration for recommendation as Wilderness. Since a portion of the Peabody Project Area falls within the boundaries of the Wild River Roadless Area, the effects of the project proposal on the roadless characteristics of this area will be analyzed. Not all of the roadless characteristics will be evaluated, since only some of these characteristics are affected by the Peabody project proposal.

The following roadless characteristics will be analyzed:

- To be roadless, an area must have less than a 0.50 mile (½-mile) of improved roads per 1,000 acres of National Forest.
- To be roadless, the percentage of an area that has had a regeneration timber harvest (clear cuts, seed tree cuts and shelterwood cuts) within the past 10 years must be less than 20%.
- To be roadless, the percentage of an area that has non-native tree plantations or permanent wildlife openings must be less than 15%.
- To be roadless, an area should have a core of solitude of at least 2,500 contiguous NF acres that is not impacted by motorized influences (and meets primitive or semi-primitive non-motorized recreation opportunity guidelines).

The Forest Plan Revision Roadless Area Inventory has determined that the Wild River Roadless Area includes 71,387 NF acres, with 10.05 miles of improved roads (a density of 0.14 mile per 1,000 NF acres). **The Analysis Area for direct, indirect and cumulative effects on roadless characteristics** is the Forest Plan Revision Wild River Roadless Area. This Analysis Area does not include the Great Gulf Extension Roadless Area since there are no proposed activities in this area. The analysis will consider the existing characteristics of the Wild River Roadless Area (as detailed in the Roadless Area Inventory), and how the proposed project, and any projects in the foreseeable future, may effect these characteristics. Since the Forest Plan Revision will make a determination on future management of the Wild River Roadless Area, the foreseeable future will include any potential activities between now and the implementation of the revised Forest Plan, anticipated to be early in 2005.

Wilderness Characteristics

Once an area has qualified as Roadless, it is evaluated in the Forest Plan Revision process to determine if it has characteristics consistent with a Wilderness. These Wilderness

characteristics describe those attributes of an area that may or may not recommend it as Wilderness. The effects of the project proposal on the Wilderness characteristics of the Wild River Roadless Area will be analyzed. Not all of the Wilderness characteristics will be evaluated, since only some are affected by the Peabody project proposal.

The following Wilderness characteristics will be analyzed:

- Solitude, or the degree to which an area provides visitors with a Wilderness experience. Analysis will consider short-term effects and any reduction in the core area of solitude as a result of the project proposal.
- Degree of Disturbance, or the degree to which an area's natural appearance may be altered. Analysis will consider the effects of timber harvest and road restoration or construction.

Analysis of Wilderness characteristics may involve some of the same criteria as the roadless characteristics. However, a proposed project may not affect an area's designation as Roadless (because it would not change the quantitative criteria to a point the area would no longer qualify as Roadless), but it may still affect an area's Wilderness characteristics (because it may affect some change in solitude or degree of disturbance).

The Analysis Area for direct, indirect and cumulative effects on Wilderness characteristics is the same as for roadless characteristics. The time frame for cumulative effects will be the same, as well.

Consideration for Wilderness

The Forest Plan Revision process will determine the availability of a Roadless Area for consideration as a potential Wilderness. While the Peabody project may affect roadless and/or Wilderness characteristics of the Roadless Area, it does not propose any activities that would make the Wild River Roadless Area unavailable for consideration as potential Wilderness in the Forest Plan Revision.

3.5.2 Direct and Indirect Effects on Roadless/Wilderness Character

Summary of Direct & Indirect Effects on Roadless/Wilderness Character

Analysis Area	Time Period	Estimated Acres
Wild River Roadless Area	Present	71,387 NF acres

Alternative	Summary of Direct & Indirect Effects
1	Proposes no activities, No effect to roadless or Wilderness characteristics
2	62 acres of regeneration harvest and 4 acres of wildlife openings will not affect roadless designation, but will add to degree of disturbance evident in the Roadless Area; 0.25 mile of added improved road will not affect roadless designation or core area of solitude
3	57 acres of regeneration harvest, 3 acres of wildlife openings and no added improved roads; effects similar to Alternative 2 but reduced in scale
4	47 acres of regeneration harvest, 3 acres of wildlife openings and no added improved roads; effects similar to Alternative 3 but reduced in scale

Alternative 1: No Action Alternative

Alternative 1 proposes no timber harvest or road restoration or construction, and it would have no effect on the roadless or Wilderness characteristics of the Analysis Area.

Action Alternatives 2-4

The 1986 Forest Plan permits up to 1,496 acres of regeneration harvest and 449 acres of wildlife openings on MA 2.1 and 3.1 lands within the Analysis Area. To qualify as a Roadless Area, the criteria permit up to 14,278 acres of regeneration harvest and 10,708 acres of wildlife openings within the Analysis Area, well beyond the scope of what is permitted by the existing Forest Plan. Within the Analysis Area, Alternative 2 proposes 62 acres of regeneration harvest and 4 acres of new wildlife openings; Alternative 3 proposes 57 acres of regeneration harvest and 3 acres of new wildlife openings; and Alternative 4 proposes 47 acres of regeneration harvest and 3 acres of new wildlife openings. When added to the existing acres of regeneration harvest and wildlife openings identified in the Roadless Area Inventory for the Wild River Roadless Area, the acres proposed in each of the Action Alternatives fall well short of what is permitted by the roadless criteria (Table 17).

The roadless criteria would permit up to 35.7 miles of improved roads in the 71,387-acre Wild River Roadless Area. The inventory identifies 10.05 miles of existing improved roads. Alternative 2 proposes an additional 0.25 mile of improved road, still well below the amount permitted by the roadless criteria (Table 17). This improved road, the ¼-mile restoration providing access to stands 40/19 and 40/102, would not extend far enough into the Roadless Area to have an effect on the core area of solitude. Alternatives 3 and 4 do not propose any additional improved roads in the Analysis Area.

The Action Alternatives would have limited effect on the roadless characteristics of the Analysis Area, and no effect on its eligibility as a Roadless Area. The Action Alternatives will add to the degree of disturbance in the Analysis Area, but they will not result in an irreversible or irretrievable change in the condition of the land or its capability as potential Wilderness.

3.5.3 Cumulative Effects on Roadless/Wilderness Character

Summary of Cumulative Effects on Roadless/Wilderness Character		
Analysis Area	Time Period	Estimated Acres
Wild River Roadless Area	Present 2003-2005	71,387 NF acres

Alternative	Summary of Cumulative Effects
1	Does not contribute to cumulative effects on roadless or Wilderness characteristics
2	Foreseeable actions in near future will contribute to effects of the proposed 62 acres of regeneration harvest and 0.25 mile of added improved road, however, when considered cumulatively, neither this or the future proposed actions will affect the roadless designation; the foreseeable future actions would reduce the core of solitude by approximately 570 acres, or 1.1%
3	With fewer acres of regeneration harvest and no added improved road miles, Alternative 3 contributes less to cumulative effects than Alternative 2
4	With fewer acres of regeneration harvest and no added improved road miles, Alternative 4 contributes less to cumulative effects than Alternative 2 or 3

The Analysis Area includes 14,959 acres of Management Area 2.1 and 3.1 lands on both the Androscoggin and Saco Ranger District. The Connor Brook watershed (near the Maine state line) falls within the Wild River Roadless Area and the Androscoggin Ranger District anticipates proposing a number of acres within the watershed for regeneration harvest in the next few years. The Saco Ranger District anticipates that the Chandler-Round Vegetative Management Project will have some proposed harvest units and possibly some new road construction within the Wild River Roadless Area. The Saco District anticipates this may include 3 regeneration harvest units totaling 80 acres, and the possibility of ½-mile of added improved road that could extend far enough into the expanded area to reduce the core area of solitude by 570 acres, or 1.2% (Table 17).

The Action Alternatives, when considered cumulatively with these anticipated future actions, would still have no effect on the eligibility of the Analysis Area as a Roadless Area. The anticipated future actions may reduce the core area of solitude, and the Action Alternatives will add cumulatively to the degree of disturbance in the Analysis Area, but they will not result in an irreversible or irretrievable change in the condition of the land or its capability as potential Wilderness.

Table 17. Summary of Cumulative Effects on Draft Wild River Roadless Area

Roadless Characteristics	Draft Wild River Roadless Area			
Total Acres	71,387			
Regeneration Acres				
Acres Allowed to Remain Roadless (20%)	14,278			
Acres Allowed by Current Forest Plan ¹	1,496			
Inventoried Regeneration Acres	77			
Acres Added by Peabody Proposal	Alt 1	Alt 2	Alt 3	Alt 4
	0	62	57	47
Acres Added by Foreseeable Future Actions	80			
Improved Roads				
Miles Allowed to Remain Roadless	35.7			
Inventoried Miles	10.05			
Miles Added by Peabody Proposal	Alt 1	Alt 2	Alt 3	Alt 4
	0	0.25	0	0
Miles Added by Foreseeable Future Actions	0.50			
Permanent Wildlife Openings				
Acres Allowed to Remain Roadless (15%)	10,708			
Acres Allowed by Current Forest Plan ²	449			
Inventoried Permanent Wildlife Opening Acres	35			
Acres Added by Peabody Proposal	Alt 1	Alt 2	Alt 3	Alt 4
	0	4	3	3
Acres Added by Foreseeable Future Actions	0			
Solitude				
Acres Allowed to Remain Roadless	2,500			
Inventoried Core Acres of Solitude	54,982			
Core Acres after Peabody Proposal (All Alternatives)	54,982			
Core Acres after Foreseeable Future Actions ³	54,412			
¹ Equals maximum allowed under current Forest Plan (10% of MA 2.1 and 3.1).				
² Equals maximum allowed under current Forest Plan (3% of MA 2.1 and 3.1).				
³ Proposed Chandler-Round Vegetative Management Project (Saco RD) would construct 0.5 mile of improved road, affecting existing core area of solitude				

3.6 Soils

No Issues Related to Soils

3.6.1 Soil Erosion

3.6.1.1 Affected Environment for Soil Erosion

The Peabody Project Area has soils common to the White Mountain National Forest. At elevations generally below 2500 feet, the soil is mainly deep-, well- and moderately well-drained, sandy loam tills on 10-25% slopes. Hardpan is found in the moderately well-drained soils; otherwise the soil is loose till. These soils correspond to the areas of “suitable” land base, where vegetation management is permitted on the National Forest. The specific Ecological Land Types (ELTs), affiliated soil types and succession and climax forest associations in the Peabody Project Area are summarized in the Table 18.

Table 18. Ecological Land Types (ELTs), Soil Types and Forest Associations

ELT	Common Series	Depth	Surface Texture	Drainage	Succession Species ²	Climax Species
11	Colton, Adams	60” ⁺⁺	Loamy sand	Excessive	Aspen-Paper Birch	Spruce-fir-hemlock
105d	Hermon	60” ⁺⁺	Sandy Loam	Well	Paper Birch	Spruce-fir-hemlock
105	Monadnock	60” ⁺⁺	Sandy Loam	Well	Yellow Birch	Beech-Red Maple
115c	Berkshire, Peru	60” ⁺⁺	Fine Sandy Loam	Well	Yellow Birch	Sugar Maple-Beech
115g	Peru, Marlow	60” ⁺⁺	Fine Sandy Loam	Mod.Well	Yellow Birch	Sugar Maple-Beech-Ash
115a	Peru, Marlow	60” ⁺⁺	Fine Sandy Loam	Mod.Well	Red Maple, Yellow Birch	Spruce-fir

¹ White Mountain Landscapes and its affiliated tables provide more detail for the ecological types on the White Mountain National Forest. Also, Forest Habitat Types by Bill Leak, Northeast Research Station.

² This is a partial listing of predominant species. More detail is available in tabular form.

The Analysis Area for direct and indirect effects on soil erosion is the MA 2.1 and 3.1 lands within HMUs 213 and 214, encompassing 10,154 NF acres. Within this land base, there are a number of possible soil hazards that may occur; these include dry debris slides, deep soil slumps, surface soil erosion and soil compaction. Dry debris slides are

not a risk for this project because they occur at elevations significantly upslope of the proposed area where no road or timber sale activity is planned. There is a risk of a deep soil slump at one location along Route 16 where a proposed temporary road location into stand 40/102 crosses a steep slope. On-site examination revealed that the soil at this location is a moderately well drained, poorly graded, slightly plastic fine sandy loam, and silt loam that is known to represent a slump hazard (LRMP at VII-F-3).

Surface soil erosion is always a concern, especially related to road construction and skid trails. In the proposed Project Area, approximately 17% of the stands are soils with a low surface soil erosion hazard, 63% have a moderate soil erosion hazard and 20% have a high soil erosion hazard (LRMP at VII-F-3), based on a hazard rating relative to soils throughout the National Forest. Overall, soil erosion in eastern forests is not considered a problem when Best Management Practices (BMPs) are applied in a timely way (Martin et al). Field monitoring on the White Mountain National Forest supports this conclusion (2000 Monitoring Report).

Roads and skid trails are the main concern for soil erosion because they expose bare mineral soil that may erode (Patric). The act of cutting trees is not a source of soil erosion because it does not expose mineral soil (Hornbeck). Permanent, all season roads in the Project Area are maintained to Forest Plan standards that help prevent concentration of water on the road surface. Concentrations of water may cause channeling on the road surface which can lead to soil erosion. Site visits to the Project Area found no evidence of channeling due to accelerated soil erosion on all season roads. Intermittent, seasonal roads, or those used occasionally for management purposes, were properly closed following their last use and have resulted in no accelerated soil erosion issues since that time, though there may be instances of localized surface erosion. Evidence of minimal soil erosion in this vicinity supports research that soil erosion at managed forestry operations can be controlled through timely application of standards and guidelines (Martin et al). It is also consistent with other findings that eastern state forestlands can be managed so there is little or no increase in soil erosion (Patric).

Existing log landings from previous sale activity are well located and stabilized, and do not show signs of soil erosion based on field inspection. They are not considered a significant source of soil erosion (Stone), but may sometimes present concerns about soil compaction. However, research reveals that soil bulk density of landings returns to pre-harvest densities two to three years following harvest (Donnelly et al). This does not mean however, that one cannot find log landings years after use because in many cases they remain visible on the land.

The Analysis Area for cumulative effects on soil erosion **is the Cumulative Effects Area used for water resources (see Section 3.7.1.1, Water)**. It encompasses 59,500 acres, including private and public lands, and it includes the entire extent of the Moose and Peabody Rivers before they enter the Androscoggin River. Land management activities such as harvesting, and road construction and restoration typically result in site specific soil erosion that is generally limited to the area of impact. However, since the effects of soil erosion are often of greatest concern in streams and rivers, an analysis of cumulative effects needs to consider incremental impacts on watersheds. The effects analysis extends from 10 years in the past, including harvests in 1997 and 1999, to anticipated future projects over the next 10 years.

3.6.1.2 Direct and Indirect Effects on Soil Erosion

Summary of Direct & Indirect Effects on Soil Erosion

Analysis Area	Time Period	Estimated Acres
National Forest lands designated as MA 2.1 and 3.1 in HMUs 213 and 214	Present	Approximately 10,154 NF acres

Alternative	Summary of Direct & Indirect Effects
1	Some localized soil erosion due to ongoing maintenance of Forest roads
2	Soil erosion associated with logging and road construction & restoration, Summer harvest potential on 663 acres with medium to low erosion hazard, Restoration on 5.3 miles of Forest roads with some sheet erosion and little expected accelerated erosion, 70% chance of deep soil slump on ¼-mile road restoration to access stands 40/19, 40/102 & 40/102a
3	Similar effects to Alternative 2 with fewer opportunities, Summer harvest potential on 102 acres with medium to low erosion hazard, Restoration on 4.8 miles of Forest roads with some sheet erosion and little expected accelerated erosion, Eliminates ¼-mile road restoration with slump potential
4	Similar to Alternative 3, Same acres of summer harvest potential and same miles of road restoration, Constructs 300-foot temporary road in floodplain

Alternative 1: No Action Alternative

Alternative 1 may have localized soil erosion related to on-going maintenance of permanent, all season Forest roads. In the absence of activities such as timber harvesting, and road construction and restoration, Alternative 1 will have no direct or indirect effects from soil erosion that typically results from these activities.

Alternative 2: Original Proposed Action

Continuing maintenance of the FR 207 (Pinkham B road) would briefly increase the risk of sheet erosion, though accelerated soil erosion from concentrated surface flow would be unlikely. Sheet erosion means erosion initiate by raindrop splash, not surface water that may lead to channel formation characteristic of accelerated erosion. Having well-maintained ditches and culverts on properly designed roads with environmentally safe outlets for surface water would minimize effects because the volume and discharge of water would not initiate accelerated soil erosion. Road restoration of 5.3 miles of summer, intermittent roads may lead to sheet erosion when mineral soil is exposed and ruts may appear from truck use. Temporary drainage and gentle to moderate slopes on moderately well and well-drained soils would lead to some sheet erosion, and little or no accelerated soil erosion. In addition, a substantial portion of this alternative would include winter or frozen ground harvest that should further minimize erosion potential.

Reconstruction of a ¼-mile of road off Route 16 to access stands 40/19, 40/102 and 40/102a has an estimated 70% chance of deep soil slump (Fay, 2003). The soil material

is deep, slightly plastic silt that tends toward the condition where slumps have been observed. A deep slump is a mass failure that brings tons of soil material down slope, re-depositing it along the slope and at its base. Stabilization of slump faces along a road usually requires rock facing to control erosion until re-vegetation occurs.

Skidding would affect an estimated 1,371 acres, all within the slope guidelines of the 1986 Forest Plan. Site-specific field examination would limit skidding to winter-only on 708 acres (or about one-half the skid trails) where soils are mainly moderately well drained tills over hardpans, and therefore have a high soil erosion hazard. The erosion hazard for the applicable soils appears in the 1986 Forest Plan (VII-F-3). Summer or winter harvest would be planned on the remaining 663 acres. This skidding would be mainly on well-drained soil on mountain side-slopes with moderate to low surface soil erosion hazard. Site specific field experience in the vicinity of the winter and summer harvest areas has demonstrated that mitigation measures have been effective in eliminating or limiting accelerated soil erosion on stabilized skid trails.

Log landings are not considered a significant source of soil erosion because of their relatively small size and location on generally flat terrain and well-drained soils, away from streams limits the hazard (CFRU Information Report 38). In this alternative, 16 log landings would be used. There could be substantial churning of the exposed mineral soil, especially with summer and fall harvesting; however, the small size of the landings, and careful location and consideration of surface drainage patterns would limit the possible magnitude of soil erosion to on-site redistribution of soil. All landings would be reshaped after use, and stabilized with seed, fertilizer and lime, if needed, to prevent erosion after harvesting operations are completed. Soil compaction would occur, but experience and research indicate that, once closed, these sites revegetate due to well-distributed rainfall and recovery of soil bulk density within 2-3 years (Donnelly et al).

Indirect effects from soil erosion for all Action Alternatives include possible stream sedimentation. See Watershed Section (Section 3.7) for analysis of water quality.

Alternative 3: Modified Proposed Action

Alternative 3 differs from Alternative 2 by eliminating approximately 2,600 feet of road restoration (including eliminating the road across the slump bank and replacing it with a 200-foot temporary road in a different location that includes a temporary bridge across Imp Brook), and reducing timber harvest by 123 acres. Access to stands in HMU 213, and near the Rattle River in HMU 214, would be restricted to winter only.

As with Alternative 2, there would be a limited amount of surface soil erosion, and little or no accelerated soil erosion. The impacts of log landings would be the same as Alternative 2, although one additional landing is included. There are no soils, topographic or surface water drainage factors that present extraordinary concerns that are significantly different from Alternative 2. This watershed has a history of land use, including timber management, on deep, well or moderately well drained soil well within the scope of conditions anticipated and analyzed in the FEIS for the 1986 Forest Plan.

Alternative 4: Reduced Even-Aged Management

Alternative 4 is similar to Alternative 3 with one notable exception. The location for a temporary road to access stands 40/19, 40/102 and 40/102a from Route 16 appears to cross Imp Brook in a floodplain. There is no evidence of ice damage on the trees, or an overflow channel. Construction of a temporary bridge, in the winter, using mud sills, with no excavation in the stream channel or banks, would not alter the flow of the stream, or the function of the floodplain. Effects of soil erosion related to roads and skid trails, and soil compaction on the 17 log landings would be the same as for Alternative 3.

3.6.1.3 Cumulative Effects on Soil Erosion

Summary of Cumulative Effects on Soil Erosion		
Analysis Area	Time Period	Estimated Acres
Cumulative Effects Analysis Area for Water Resources (5 project watersheds + 7 additional watersheds comprising entire extent of Moose and Peabody Rivers)	1900-2003 Present 2003-2013	Approximately 59,500 acres of private and public lands

Alternative	Summary of Cumulative Effects
1	Potential for soil erosion due to past, present and foreseeable activities is present, but is expected to be limited because of mitigation measures, Any incremental impacts from National Forest lands likely limited to ongoing road maintenance
2	Incremental soil erosion impacts from logging, and road construction, restoration and ongoing maintenance activities contribute to past, present and foreseeable activities on private and public lands, Mitigations limit effects to those anticipated and analyzed in 1986 Forest Plan FEIS, Exception is potential for localized mass failure due to road restoration on slump bank
3	Similar to Alternative 2, with fewer total and summer harvest acres and road restoration mileage, No proposed road restoration on slump bank
4	Similar to Alternative 3, no change in harvest acres, season of harvest or road restoration miles, Proposes 300-foot temporary road construction in floodplain

Cumulative soil erosion impacts within the Analysis Area are generated primarily from past timber harvesting on public and private lands, road maintenance on public and private roads and parking lots, and the Stony Brook residential development.

The majority of the Analysis Area is heavily forested so exposed mineral soil is the exception. Closed sales, skid trails and existing roads contribute little to soil erosion due to waterbars, revegetation of road surfaces, road maintenance, and the well and moderately well drained quality of the soils. The Stony Brook development is subject to local zoning ordinances, and, possibly, alteration of terrain permits, both of which seek to minimize or eliminate soil erosion (and sedimentation). Other significant developments within the Analysis Area include the Mt. Washington Auto Road, the Wildcat Ski Area, the State Highway Department garage on Route 16, and several parking areas for vistas and trailheads. Cumulative soil erosion impacts from these features are considered to be

small due to the use of erosion control measures, the low soil erosion hazard, and the forest cover on most of the watershed that is acting to retain organic layers of the soil.

Within the past 10 year, three Forest Service timber sales (Pinkham B, Raven and Spring Brook) harvested an estimated 428 acres, including 15 acres of clearcuts and 144 acres of final-stage shelterwood cuts, and 91 acres of overstory removal. These sales used existing roads for access. There has also been about 170 acres of timber harvest by selective methods on private land within the Analysis Area. Possible future actions that may occur within the next ten years are the development of a mountain biking trail system and a trail relocation with a parking lot to support it. No other timber sales, either on private or public lands, are anticipated within this area in the foreseeable future.

For each of the Action Alternatives, there would be cumulative soil erosion impacts from the proposed project, the adjacent residential development, proposed recreation development (mountain biking trail, parking lot) and other potentially erosive features, such as the Mt. Washington Auto Road and the Wildcat Ski Area. But overall, the terrain and soils are suitable for the proposed vegetative management activities; and the Forest Plan standards and guidelines, Best Management Practices and/or local ordinances will apply to all of these features. As a result, the cumulative soil erosion impacts are likely to be site specific, limited in magnitude and duration, and well within the scope of the effects anticipated and analyzed in the FEIS for the 1986 Forest Plan.

Alternative 2 would contribute to soil erosion in two ways; restoration of a road across a potential slump bank and road improvements and skid trails. The road across the slump face would likely lead to substantial soil movement, which in turn means the cumulative impact on soil erosion could be substantial. The cumulative impact would be limited since no streams are nearby and it is not likely to affect public safety. Alternative 3 avoids the potential cumulative impact of restoring the road across a possible slump face. The cumulative effects for Alternative 4 would be the same as Alternative 3, although it considers construction of a temporary road through a floodplain. In this instance, because the road is temporary, it would not permanently alter the floodplain from its present condition.

3.6.2 Soil Calcium

3.6.2.1 Affected Environment for Soil Calcium

Research at the Hubbard Brook Experimental Forest on the White Mountain National Forest indicates there is a concern about soil calcium loss from atmospheric deposition and timber harvest (Federer 1989) on long-term forest productivity, health and composition. This analysis focuses on bole-only harvest for a 120-year rotation length.

Soils within the Project Area are deep and moderately or well drained. There is one stand on outwash sand soil, and research indicates that bole-only harvest is acceptable on this soil type. In general, soil calcium concentrations are at the higher end in this northern portion of the Forest. However even at Bartlett Experimental Forest, where calcium concentrations are low, measurements since 1934 do not indicate a change in forest

biomass accumulation (growth). A summary of other measurements near Bartlett, including bole-only and whole-tree harvest, and clearcutting, do not indicate biomass accumulation has been impacted (Fay et al 1997) and sixty years of measurements has not indicated any changes in forest composition (Leak et al 1998). Forest health measurements made on the White Mountain National Forest as a part of a regional study indicate only minor branch dieback that might be attributed to soil calcium changes, in comparison to significant mortality in western Pennsylvania (Hallett et al 2001).

Soil calcium in the Project Area has probably been affected by atmospheric deposition and early timber harvest practices. Based on research at Hubbard Brook, it is estimated that 5% of the total soil calcium may have been lost since 1950 when acid rain began in earnest (Federer 1989). Using updated information that includes mineral weathering, this number can be reduced to about 2% (Fay 2003). Land use records indicate the Peabody area was harvested in the early part of the 1900s, and that the stands were “lightly culled” (Goodale 1999). This would translate into about a 1% loss of soil calcium (Fay 1993). The history of all stands is not known, but large portions of this vicinity were treated this way. It is estimated, therefore, that about 3% of the total soil calcium may have been lost due to atmospheric deposition and timber harvest up to this time.

The Analysis Area for direct, indirect and cumulative effects to soil calcium is the location of the actual harvest activity. Site-specific soil impacts related to soil or forest productivity are not likely to extend further. The time span for this analysis is from early harvesting at the beginning of the 20th century to 10 years into the future, which is the reasonable planning horizon for public and private entities. Early harvesting is considered because land use history affects soil nutrients, including calcium. Future harvesting and atmospheric deposition are considered for the same reason. The Project Area is composed of second-growth hardwood forest, regenerated from around 1900.

3.6.2.2 Direct and Indirect Effects on Soil Calcium

Summary of Direct & Indirect Effects on Soil Calcium

Analysis Area	Time Period	Estimated Acres
Project Area (proposed cutting units)	Present	Alt 1 (0ac), Alt 2 (1,371ac), Alts 3&4 (1,248ac)

Alternative	Summary of Direct & Indirect Effects
1	Current levels of soil calcium would be maintained, Retained soil buffering capacity may help minimize effects to forest productivity, species composition, and forest health from acid deposition
2	Current levels of soil calcium would be reduced by 2% on 149 acres, and by less than 1% on 1222 acres, Reduced buffering capacity of soil due to calcium loss effects ability to neutralize acid deposition
3	Current levels of soil calcium would be reduced by 2% on 116 acres, and by less than 1% on 1132 acres, Effects same as Alternative 2
4	Current levels of soil calcium would be reduced by 2% on 63 acres, and by less than 1% on 1185 acres, Effects same as Alternative 2

Alternative 1: No Action Alternative

Because timber harvest would not occur in Alternative 1, the current supply of soil calcium within the Project Area would be available to buffer impacts from acid deposition. Research findings based on detailed modeling at Hubbard Brook indicate that soil calcium recovery from past harvest and acid deposition is possible.

Indirectly, retaining soil calcium can help to minimize possible impacts to forest productivity, species composition, or health that may result from future timber harvest or acid deposition. The consequence, based on current research, is that these forest qualities will likely remain unchanged (WM Monitoring Report 2000, pp. 43-50). The only evidence of negative indirect effects in northern hardwoods is limited dieback of branches on trees within the sugar maple decline study sites located on the Forest (Hallett, 2000). Species other than sugar maple have not shown evidence of decline. Sugar maple is of special interest because it is a calcium demanding species.

Action Alternatives 2-4

Harvesting activities in Alternatives 2, 3 and 4 would contribute to potentially lowering the buffering capacity of the soil. Clearcut and seed tree harvest lead to an estimated 2% loss of soil calcium from a single entry, (bole-only harvest) in northern hardwood forest (Fay et al 1993). Clearcuts and seed tree cuts have a greater short-term effect on soil calcium loss because more biomass is removed from the site and harvest-induced leaching occurs when this intensity of harvest occurs. Single-tree selection, thinning and group cut leads to a <1% loss of soil calcium from a single tree, bole-only harvest in northern hardwood forest (Fay et al 1993). Differences among the Action Alternatives relate to the proportions of these two categories of harvest, and the acres harvested.

The direct effects of timber harvest can be compared for the Action Alternatives by estimating calcium loss by acres proposed for each management system. Alternative 2, which proposes the most acres of even-aged harvest (including 139 acres of regeneration clearcuts and seed tree cuts, and 10 acres of wildlife openings), would experience the largest calcium depletion of the Action Alternatives. Alternative 4, which proposes the fewest acres of even-aged harvest (54 acres of regeneration clearcuts and seed tree cuts, and 9 acres of wildlife openings), would experience the lowest calcium depletion of the Action Alternatives.

The indirect effects of timber harvest relate to forest productivity. Measurement of permanent northern hardwood plots at Bartlett Experimental Forest and other sites across the White Mountain National Forest does not indicate a statistically distinguishable change in forest productivity due to human impacts, even including the impacts of acid deposition (Nuegenkapien 1998). There is a continuing concern, however, about the impacts of acid deposition on forest productivity and health, especially related to sugar maple (NAPAR 1998). Research on this topic continues in the Northeast. Other related studies are already summarized (Hallett 2000; Fay et al 1997; Adams 2000).

Stocking surveys of harvested areas across the National Forest indicate clearcuts successfully regenerate within three years of harvest, except where moose browsing is an

issue (Mulherin 2003). Visits to “till source” study plots across a full range of calcium richness sites on the White Mountain National Forest did not reveal any qualitative evidence of changes in forest health on northern hardwood stands over 60+ years old at low, mid and ridge-top positions similar to those found in the Analysis Area (Fay 2003). A detailed summary of applicable literature is available in the project record (Fay 2003).

3.6.2.3 Cumulative Effects on Soil Calcium

Summary of Cumulative Effects on Soil Calcium		
Analysis Area	Time Period	Estimated Acres
Project Area (proposed cutting units)	1900-2003	Varies by Alternative Alt 1 (0ac), Alt 2 (1,371ac), Alts 3&4 (1,248ac)
	Present	
	2003-2013	

Alternative	Summary of Cumulative Effects
1	Current levels of soil calcium would be maintained, Retained soil buffering capacity may help minimize effects to forest productivity, species composition, and forest health from acid deposition
2	Most cumulative soil calcium depletion due to most acres in even-aged harvest, but not enough depletion to have long term effects on soil productivity
3	Less depletion than Alternative 2 because of fewer acres in even-aged harvest
4	Less depletion than Alternative 3 because of fewer acres in even-aged harvest

Acid deposition is likely to continue to occur within the Analysis Area for the next 10 years, with an expected 1.6% depletion in soil calcium over that time (Federer 1989).

Action Alternatives 2-4

The cumulative effect of calcium depletion on the stands proposed for harvest includes an estimated 1% (land use history) + 2% (acid deposition up to 2001) + 2% (proposed harvest) + 1.6% (future acid deposition) = 6.6% on those acres prescribed for clearcuts or seed tree cuts. In those cases when other methods are applied (e.g. single-tree, thinning, small groups), the proposed harvest value would change from 2% to <1%, reducing the cumulative calcium depletion to <5.6%. When applying these percentages to the Action Alternatives, it is evident that the largest cumulative depletion of soil calcium would occur in Alternative 2, which has the most acres of clearcuts and seed tree cuts. The lowest cumulative depletion would occur in Alternative 4, with the fewest acres of clearcuts and seed tree cuts.

All previous research findings are for sites that have been affected by a similar regime of acid deposition since the 1950's, plus early harvest and recent harvests. For these reasons, it is estimated that changes in long term soil productivity are not occurring at a magnitude that will lead to changes in forest productivity, health or species composition.

3.7 Water

No Issues Related to Water

3.7.1 Watershed

3.7.1.1 Affected Environment for Watershed

Peabody Timber Sale is located in the Middle Peabody River, Townline Brook, Pea Brook, Rattle River and Leadmine Brook watersheds. All five watersheds are tributaries of the Androscoggin River. They are referred to here as the “project watersheds”, and they comprise **the Analysis Area for direct and indirect effects on water resources**.

The 6th-level Middle Peabody River project watershed contains approximately 9,680 acres. The watershed is aligned north to south with the outlet to the north. Clay Brook, Townline Brook, Imp Brook, and unnamed tributaries flow into the Middle Peabody River from the east, while Culhane Brook, Barnes Brook, Bear Spring Brook, and additional unnamed tributaries enter it from the west. The Great Gulf watershed and the headwaters of the Peabody River watershed flow into the Middle Peabody River watershed from the south. These three watersheds form a larger cumulative watershed with a combined acreage of 26,130. Wildcat Ridge borders this area to the south, and Chandlers Ridge borders it to the west.

The 6th-level Townline Brook project watershed contains approximately 4,680 acres. The main drainage in this watershed is the Moose River, which flows from the southwest to the northeast. Townline Brook is the dominant tributary to the Moose River in this watershed, and enters the Moose River from the south. The Moose River headwaters, Carlton Brook, Bumpus Brook, Snyder Brook, and Cold Brook watersheds flow into the Townline Brook project watershed from the west to form a larger cumulative watershed with a combined acreage of 15,130. The western end of these watersheds is bordered by Mount Bowman.

The 6th-level project watershed of Pea Brook contains approximately 5,820 acres and is comprised of tributaries that flow from both the north and south into the Androscoggin River. Pea Brook, Josh Brook, and an unnamed tributary flow into the Androscoggin River from the south, while three unnamed perennial tributaries enter it from the north. The watershed contains approximately 5,820 acres and is bordered to the south by Mount Moriah, to the east by Mount Evans, to the west by Mount Surprise, and to the north by Mount Hayes.

The 6th level Rattle River project watershed is a 2,850 acre watershed that lies just east of the Pea Brook watershed. The main stem of the Rattle River flows from south to north, culminating in the Androscoggin River. In addition to the main stem of the Rattle River, an intermittent tributary contained within the watershed boundaries flows directly into the

Androscoggin River. Shelburne Moriah Mountain borders the watershed to the east, while Middle Moriah Mountain and Mount Evans border it to the west.

The watershed of Leadmine Brook lies just north of the Rattle River and Pea Brook watersheds. The Leadmine Brook watershed is not delineated on Forest Service maps because a majority of the watershed falls outside the forest boundaries. It was delineated by the hydrologist from the large 5th level Middle Androscoggin River Watershed (41,800 acres) so that this watershed area was comparable in size to the other project watersheds areas. The resulting Leadmine Brook project watershed is 5,530 acres in size. Peabody Brook and Leadmine Brook flow southerly in this project watershed from Bald Cap and Cascade Mountain into the Androscoggin River. Additional inputs to the Androscoggin River come from minor side slope runoff originating at Mount Winthrop.

The Cumulative Effects Analysis Area (CEA) for water resources is the five project watersheds (Middle Peabody River, Townline Brook, Pea Brook, Rattle River, and Leadmine Brook watersheds) plus the Great Gulf, headwaters of the Peabody River, Moose River headwaters, Carlton Brook, Bumpus Brook, Snyder Brook, and Cold Brook watersheds (Figure 1). The seven additional watersheds are considered because they are the headwaters to two of the project watersheds (Middle Peabody and Townline Brook). The total size of the Analysis Area is 59,500 acres, and it includes the entire extent of the Moose and Peabody Rivers before they enter the Androscoggin River.

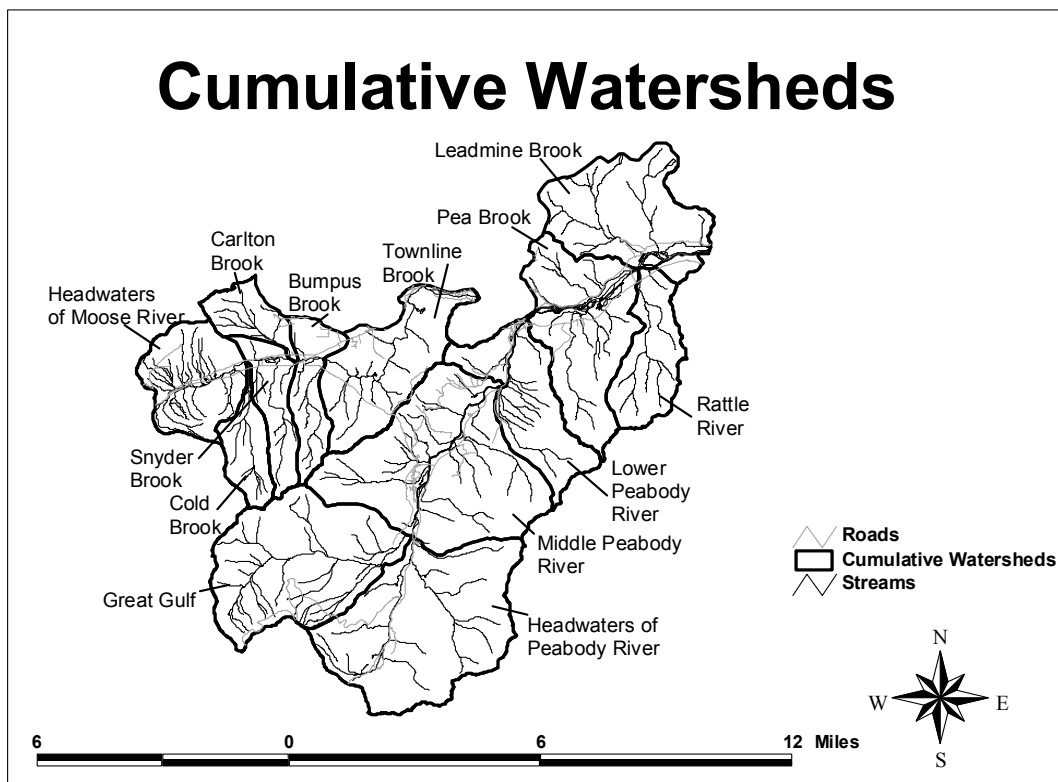


Figure 2. Peabody Project Watersheds, Analysis Areas for Direct, Indirect and Cumulative Effects

The effects of multiple uses within this scale of watershed could become additive and result in cumulative effects. As water flows downstream, changes in water yield and chemistry related to the project merge with other waters within the watershed, allowing for an analysis of the overall effect of changes in the watershed. The outlet of the cumulative watershed boundary is the Middle Androscoggin River in the Leadmine Brook watershed. This scale is large enough to integrate processes within the watershed and gather the result to a single point at the outlet.

3.7.2 Water Quantity

3.7.2.1 Affected Environment for Water Quantity

Water quantity in streams is largely related to the amount of precipitation that occurs throughout the year. Evapo-transpiration has the greatest effect on stream flow from June through September, the growing season. Changes to vegetation result in changes to stream flow during the summer low flow periods (particularly August and September). The magnitude depends on the extent of change to the vegetation (Hornbeck, et al 1993).

When trees are removed, water yield is increased. Hornbeck, Martin, and Eagar (1997) summarize that at least 20-30% of the basal area in a watershed must be cut to generate detectable increases in annual water yield. Water yield increases usually diminish within 3-10 years. Peak flows are often increased during the growing season immediately after cutting.

Based on the research described above, it is unlikely that localized water yield increases are currently present within the Middle Peabody River watershed as the result of previous timber sale activity. The Pinkham B Sale (1998-1999), Spring Brook Sale (1997-1998), and the Raven Sale (1995-1997) harvested 428 acres in the Middle Peabody watershed within the last 10 years. These sales included 178 acres of uneven-aged treatments and 250 acres of even-aged treatments spread out over five subwatersheds within the larger Middle Peabody River project watershed. Bear Spring Brook is a perennial channel that had a combined 24% of the basal area within the subwatershed harvested in the Pinkham B and Spring Brook timber sales. No other streams in the Middle Peabody watershed, including intermittent streams, had as much as 25% of the basal area removed. As such, no increase in water yield was expected to be measurable at the time of these timber sales, and there are no current effects related to water yield increase from these sales.

The Pinkham B sale overlapped both the Middle Peabody and the Townline Brook watersheds. Only a very small portion (50-60 acres) of the Townline Brook watershed was cut during this timber sale, and no measureable water yield increases were expected as a result of the Pinkham B sale.

No timber sales have occurred in the past ten years in the Pea Brook, Rattle River, or Leadmine Brook watersheds. It is unlikely that localized water yield increases are currently present within these watersheds.

In addition to timber harvest, the effects of stands damaged in the 1998 ice storm is also considered. Three stands totaling 49 acres in the Middle Peabody watershed experienced a significant enough loss of canopy to be reclassified as regeneration age. These stands were analyzed as if they had been clearcut. None of these stands represented removal of more than 1% of the basal area within the subwatersheds in which each is located.

3.7.2.2 Direct and Indirect Effects on Water Quantity

Summary of Direct & Indirect Effects on Water Quantity

Analysis Area	Time Period	Estimated Acres
Project Watersheds	1993 to Present	Approximately 25,710 acres of private and public lands

Alternative	Summary of Direct & Indirect Effects
1	No new direct or indirect effects, Roads maintained at current levels, On-going activities would continue
2	Localized short-term effects due to road restoration and timber harvest activities, amount of basal area removed in one subwatershed may exceed the level at which increases in water yield become measurable, but observed revegetation of previous harvest units diminishes this effect
3	Effects same as Alternative 2
4	Effects same as Alternative 2

Alternative 1: No Action Alternative

There would be no new direct or indirect effects on water quantity from implementation of Alternative 1 (No Action). Forest Plan direction, Standards and Guidelines, and Soil and Water Conservation Practices would continue throughout the Project Area. Current and on-going management activities would continue, but no new federal management activities would be initiated during this entry. Roads are likely to be maintained at their current level although unforeseen weather events may necessitate more extensive maintenance.

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Effects of timber harvest on flows tend to be localized and are unlikely to extend beyond first or second order streams in well-managed forests, where relatively small portions of the watershed are being harvested at a given time. Mitigation measures would combine to reduce these effects by providing a buffer to those streams with defined channels, and properly locating and making efficient use of skid trails.

The discussion on water quantity will reference smaller subwatersheds within each of the five project watersheds. These smaller subwatersheds contain all of the proposed harvest units, and analysis at this scale allows consideration of the channels directly affected by harvest activities. Effects beyond this scale are cumulative.

The measure for changes in water quantity is the percentage (%) of the basal area that has been removed over the past 10 years (including stands damaged by the 1998 ice storm), or is proposed for removal as part of this project, in each of the delineated subwatersheds of interest. The subwatersheds of interest are those that have the potential to exceed 25% removal of the subwatershed basal area. If basal area removed is less than 25%, there is no expected measurable increase in discharge.

In the Middle Peabody River watershed, two subwatersheds, Barnes Brook and Bear Spring Brook, were analyzed to determine if the proposed harvesting has the potential to alter water quantity. Barnes Brook is a perennial stream in an 1,100-acre subwatershed. It contains unit 34/50 and portions of units 33/71, 33/86, and 34/10. The Pinkham B timber sale removed 7% of the basal area in Barnes Brook subwatershed. Alternative 2 would remove an additional 6% of the basal area in the subwatershed, Alternatives 3 & 4 slightly less. The combined effects of previous and proposed harvesting (13% of basal area removed) are not enough to cause noticeable changes in water yield.

Bear Spring Brook is a perennial stream in a 242-acre subwatershed, and contains portions of units 33/71 and 33/86. The Pinkham B and Spring Brook timber sales removed 24% of the basal area of the Bear Spring Brook subwatershed. Alternatives 2 would remove an additional 2% of the basal area in the subwatershed, Alternatives 3 & 4 slightly less. For all of the Action Alternatives, the result of past and proposed timber harvest in this subwatershed is that the amount of basal area removed may exceed the level at which increases in water yield become measurable. Since water yield increases usually diminish within 3-10 years (as sites revegetate) (Hornbeck, Martin and Eager, 1997). Since the Pinkham B and Spring Brook timber sale units were harvested in 1999, a field review was conducted to determine if the harvest units in the Bear Spring Brook subwatershed had revegetated over the past 4 years. This field review noted that all of the harvest units had revegetated, thus diminishing the potential for water yield increases from these sites. It is therefore likely that the Action Alternatives will not result in any detectable increases in water yield for this subwatershed.

An unnamed intermittent tributary in the Townline Brook watershed was analyzed to determine if proposed harvesting has the potential to alter water quantity. This channel is located east of the main stem of Townline Brook, and has a subwatershed area of 302 acres, containing unit 33/41 and portions of units 33/4, 33/5, and 33/5a. No harvesting has occurred in this subwatershed in the past 10 years. The Action Alternatives propose the removal of 13-17% of the basal area of this subwatershed, which should not cause any measurable changes in water quantity.

The Rattle River watershed has an unnamed tributary that was analyzed in detail to determine if proposed harvesting would alter water quantity. This intermittent stream is located east of the Rattle River, with a subwatershed of 182 acres. It contains portions of units 42/5, 42/5a, and 42/6. The Action Alternatives would remove 17% of the basal area of this subwatershed. No measurable changes in water quantity are anticipated.

Harvesting in both Pea Brook and Leadmine Brook watersheds has no potential for altering water quantity in any of the channels. Proposed harvesting in these watersheds is limited, and no harvesting has occurred in the past 10 years.

Table 19 summarizes the past and proposed removal of basal area for each of the subwatersheds of interest, delineated to assess the effects of changed water yield related to the removal of trees. The three stands that lost their overstory as a result of the 1998 ice storm are not located in any of these subwatersheds.

Table 19. Basal Area Removed in Smaller Subwatersheds of Interest, by Alternative

Watershed	Subwatershed of Interest	Stream Type	Percent of Basal Area Removed, by Alternative				Percent of Basal Area Removed in Past 10 Years
			1	2	3	4	
Middle Peabody River	Barnes Brook	Perennial	0	6	6	6	7
	Bear Spring Brook	Perennial	0	2	2	2	24
Townline Brook	Unnamed tributary east of Townline Brook	Intermittent	0	17	17	13	0
Rattle River	Unnamed tributary east of Rattle River	Intermittent	0	17	17	17	0
NOTE: Leadmine Brook and Pea Brook Watersheds have no subwatersheds of interest							

3.7.3 Water Quality

3.7.3.1 Affected Environment for Water Quality

There are several public water supply sources within the five project watersheds. All of these are ground water wells of varying depths. There are no surface water sources within the project watersheds.

The State of New Hampshire designates surface waters in the project watersheds as Class B, meaning that these waters are considered acceptable for fishing, swimming, and other recreation purposes and, after adequate treatment, for use as water supplies. All surface waters in the Middle Peabody, Townline Brook, Pea Brook, Rattle River, and Leadmine Brook watersheds currently meet New Hampshire water quality standards.

New Hampshire anti-degradation provisions apply to all new and increased point and non-point source discharges of substances, including all hydrologic modifications and all other activities that would lower water quality or affect the existing surface waters of the State. Under these anti-degradation provisions, waters of the National Forest are designated as "Outstanding Resource Waters" (ORW) and shall be maintained and protected (NHDES, 2001). Some limited point and non-point source discharges may be allowed providing that they are an activity that results in no more than "temporary and short-term" changes in water quality, meaning that degradation is limited to the shortest possible time. Such temporary and short-term degradation shall only be allowed after *all practical means* of minimizing such degradation are implemented. Forest Plan Standards

and Guidelines, BMPs, and mitigation measures specific to this project proposal (Appendix D) represent “all practical means” and apply to all Action Alternatives.

Studies have shown that sediment from logging roads is evident during runoff events, even where BMPs are used (Patric, 1980; Likens, et al, 1970; Hornbeck et al, 1987). This indicates the importance of augmenting BMPs with Forest Plan Standards and Guidelines and site-specific mitigation measures to further reduce effects of sedimentation from roads and skid trails associated with timber harvest.

The EIS for the Forest Plan states, and experience with National Forest timber sale mitigations has shown, that sedimentation from roads, skid trails, and landings can be reduced to a negligible amount with the use of mitigations such as careful layout and construction, caution in wet and muddy conditions, and road closure. Minimizing the area of disturbed forest floor is a big step in controlling erosion and sediment movement into streams. This is accomplished by careful consideration of skid trail location, minimizing the number of skid trails, and avoiding steep slopes and wet areas. Other mitigations include the use of waterbars, avoiding operations during saturated and muddy periods, avoiding disturbance to stream channels, and winter harvest.

3.7.3.2 Direct and Indirect Effects on Water Quality

Summary of Direct & Indirect Effects on Water Quality		
Analysis Area	Time Period	Estimated Acres
Project Watersheds	1993 to Present	Approximately 25,710 acres of private and public lands

Alternative	Summary of Direct & Indirect Effects
1	No disturbance resulting from timber harvest or road restoration within which increased sediment transport could occur, current condition remains
2	Estimated 90 acres of ground disturbance from skid trails, landings and road work within which increased sediment transport could occur, Fewest acres of harvest restricted to winter operations (708 acres, 51% of all units)
3	Estimated 55.7 acres of ground disturbance from skid trails, landings and road work within which increased sediment transport could occur, Most acres of harvest restricted to winter operations (1,146 acres, 91% of all units)
4	Estimated 38.8 acres of ground disturbance from skid trails, landings and road work within which increased sediment transport could occur, Most acres of harvest restricted to winter operations (1,146 acres, 91% of all units), Temporary road location in floodplain (Imp Brook)

Alternative 1: No Action Alternative

There would be no direct or indirect effects on water quality from implementation of Alternative 1 (No Action). The current condition would remain.

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Based on field observations by timber sale administrators on the White Mountain National Forest, the maximum ground disturbance for units harvested in summer or fall is approximately 10% of the unit. For units harvested in winter, it is 1% of the unit.

The magnitude of effects caused by sedimentation is related to amount of disturbance, which is an indicator of the area across which increased sediment transport could occur. This area can be measured by acres of ground disturbance resulting from skid trails and landings, and miles of road restoration and new construction. Table 20 summarizes these measures for comparison by Alternative. Of the Action Alternatives, Alternative 4 disturbs the fewest acres (38.8), and Alternative 2 disturbs the most (90.0 acres).

Table 20. Summary of Water Quality Measures: Acres of Ground Disturbance from Timber Harvest & Road construction/Restoration

Alt	Landings	Skid Trails	Temporary Roads		Road Restoration		Total Disturbance
	acres	acres	mile	acre	mile	acre	acres
1	0	0	0	0	0		N/A
2	8.0	73	0	0	5.3	9.01	90.0
3	8.5	39	.03	.05	4.8	8.16	55.7
4	8.5	22	.06	.10	4.8	8.16	38.8
NOTE: 1 mile of road at an average width of 14' = 1.7 acres of disturbance/mile							

As part of Alternative 4 however, construction of a temporary short spur road and installation of a temporary bridge may cause a limited amount of sedimentation to accumulate in a floodplain along Route 16. The location of the bridge across Imp Brook in Alternative 4 also would encroach upon bankfull flows. The site of the bridge crossing on Imp Brook in Alternative 3, however, would not encroach upon bankfull flows. At this site Imp Brook is entrenched and excavation would not be needed to place a bridge crossing; thus there is little likelihood the floodplain would be affected.

The direct and indirect effects on water quality from the proposed Action Alternatives are anticipated to be small and temporary. The existing roads, landings, and skid trails provide an example of the condition that these facilities will be in several years following the sale if all the same mitigations are followed as before. Skid trails and landings are vegetated and stable, showing little evidence of sheet or rill erosion. However, water bars previously installed on Imp Road were very large and spaced too far apart, so that large amounts of water reached each water bar and eroded the bank where the drainage ditches and water bars met. This erosion can be prevented in the proposed timber sale by properly adhering to BMPs and mitigation measures.

The most effective factor for preventing sediments and nutrients from reaching a watercourse is a buffer strip (Gilliam, 1994). Any harvesting within 100 feet of a perennial stream will maintain at least 70% crown closure, trees adjacent to these streams will be retained, and trees will be felled directionally away from streambeds, where

possible. Skid trails, including stream crossings, will be laid out prior to harvesting, and Forest Plan Standards and Guidelines stipulate that skidding within 100 feet of a flowing stream will be limited to dry or frozen conditions, except on designated skid trails; and exposed soil will be limited to 5% of the riparian area. Many stream crossings would occur in the winter season when the banks are frozen. Winter harvest is effective at reducing disturbance at smaller stream crossings because activities occur when the channel is frozen or snow-covered. Alternatives 3 and 4 propose the most acres (1,146 acre, or 92% of proposed harvest) restricted to winter harvest, Alternative 2 proposes the fewest acres (708 acres, or 51% of proposed harvest). In all of the Action Alternatives, winter harvest may be selected for all harvest units by the operator, or the timber sale administrator may require it for resource protection. Mitigations such as temporary stream structures to protect the channel, drainage structures, and sediment control where needed, protect the overall integrity of the stream. Designated crossings are the only sites which may require restoration after the proposed activities are done. Most studies show that BMPs are effective at reducing or eliminating transport of sediments into watercourses (summarized by Stafford, et al, 1996).

3.7.3.3 Cumulative Effects on Watershed, Water Quantity and Quality

Summary of Cumulative Effects on Watershed, Water Quantity and Quality

Analysis Area	Time Period	Estimated Acres
Cumulative Effects Analysis Area for Water Resources (5 project watersheds + 7 additional watersheds comprising entire extent of Moose and Peabody Rivers)	1900-2003 Present 2003-2013	Approximately 59,500 acres of private and public lands

Alternative	Summary of Cumulative Effects
1	No disturbance resulting from timber harvest or road restoration on National Forest, No cumulative effect on disturbance resulting from activities on other lands
2	Proposed activities are within Forest Plan Standards and Guidelines for amount of acres clearcut and amount of basal area removed before increases in water yield are measurable, No new road construction, Mitigations should limit contribution to any short- or long-term cumulative effects on water quality and quantity
3	Similar to Alternative 2, with .03 mile of temporary road construction
4	Similar to Alternative 2, with .06 mile of temporary road construction

Private lands constitute 24% of the CEA, located primarily north of the Moose River and Androscoggin River. Within the past 10 years, 170 acres of selective cutting has occurred on private land within the National Forest proclamation boundary. The extent of selective cutting on private land within the entire CEA is unknown. However, clearcutting in the CEA appears to have been limited to 20 acres during this time period.

In the Middle Peabody River watershed, approximately 428 acres of National Forest lands were harvested in the past 10 years; but no measurable increases in water yields from this harvest activity is currently evident within the CEA. Less than 25% of the basal area in the CEA is proposed for removal in all Action Alternatives, so it is unlikely

that any increases in water yield would be detectible. The Forest Plan limits the amount of clearcutting to 25% of a 1,000 acre or larger watershed within a 10-year period (Forest Plan, III-17). None of the alternatives would approach the 25% limit for clearcuts in either the Middle Peabody project watershed or its smaller subwatersheds, even when combined with previous sales and activity on private lands.

Roads and residential development are likely contributing to some changes in the routing of water and sediment transport processes within the CEA. Past, present, and future road activities on the National Forest are expected to continue in much the same way as present. About 75 miles of active and inactive public roads (including Forest Service roads) are present in the CEA, an average of 6.6 feet of road per acre. Among the Action Alternatives, new road construction is limited to 150 feet of temporary road in Alternative 3 and 300 feet of temporary road in Alternative 4. The restoration of a ¼-mile road in Alternative 2 could result in soil slumping; but, since the road is not near a stream, the effects are minimal to water quality. Future road and residential development activity on private land is unknown. Residential developments require “Alteration of Terrain” permits from the State of New Hampshire, which may help to control erosion.

Recreation use in the CEA generally occurs along roads, trails, and streams. There are about 155 miles of known trails within the CEA, an average of 14 feet of trail per acre. Any effects to riparian areas from recreation use have not been documented in the CEA, nor have effects to water quality or quantity been observed or detected.

Within the CEA, there is a low risk of cumulative effects from the Action Alternatives on water quality, water quantity, or the condition of streams, riparian areas, or floodplains. Ground disturbance would be short-term in nature, and using multiple mitigation measures would diminish or eliminate their possible effects.

3.8 Fisheries

No Issues Related to Fisheries

3.8.1 Affected Environment for Fisheries

Historic logging practices likely had an adverse effect on instream habitat conditions in New Hampshire (Taylor et al. 1996). Over time, instream habitat has improved and stream inventories conducted across the White Mountain National Forest indicate that most streams have suitable instream habitat required by eastern brook trout (*Salvelinus fontinalis*). However, there continues to be a lack of habitat diversity, with the percentage of pools far lower than recommended guidelines (USDA Forest Service 1996).

The Analysis Area for direct and indirect effects on fisheries includes the Project Watersheds described in Section 3.7, Water. Most of the perennial streams in the Analysis Area are first and second order and are located on moderate to moderately-steep

slopes. **The Analysis Area for cumulative effects on fisheries**, as well as the temporal scale of 1993 to 2013, is the same as the CEA described in Section 3.7, Water. For the Proposed Action and its alternatives, effects to fisheries are similar to those for water quality and quantity.

Eastern brook trout have been monitored at nine sites across the Forest since 1992. Young of the year were present at all sites in all years, indicating that trout are well distributed across the Forest and producing young. None of the sites showed increasing or decreasing densities over the sampling years. Data was collected on the National Forest from 1992-1999 and a report generated that concluded the data “did not show any evidence that land use activities are influencing fish populations perhaps due to the larger influence of other environmental factors such as floods or mild winters” (USDA Forest Service 1999). This data suggest wild brook trout populations are viable in all the major watersheds of the White Mountain National Forest (USDA Forest Service, 2001).

Past stream inventories recorded presence of brook trout in all first and second order streams in the Analysis Area. Young of the year were observed in some of the streams in the Analysis Area, indicating spawning habitat is present. State of New Hampshire records show that brook trout are stocked in the Peabody and Androscoggin Rivers on an annual basis. Brook trout are the Management Indicator Species for lakes, ponds, and stream habitat on the White Mountain National Forest. Based on this information, it is assumed that brook trout and a variety of other fish species and aquatic invertebrates inhabit the perennial brooks in the Analysis Area.

Important factors for maintaining quality brook trout habitat include cool continuous flowing water, unimpeded travel upstream and downstream, clean gravels for spawning and egg incubation, clear waters during the growing season, instream cover, adequate food supply, high quality headwater streams, and suitable riparian habitat. The desired condition for fisheries resources for all of these streams is to meet Forest Plan Standards and Guidelines for water quality, riparian, fisheries, and aquatic habitat management (Forest Plan III-15 a-d, -16, -19, -20).

3.8.2 Direct, Indirect and Cumulative Effects on Fisheries

Direct and indirect effects to fish habitat result from sedimentation related to temporary road construction, road restoration, stream crossings, skid trails, culvert and bridge replacement, tree felling and landings. Increased turbidity in streams during any of these activities is a direct effect that could cause fish and other aquatic life to move temporarily from the area, where possible. Sedimentation is an indirect effect that is described in detail in Section 3.7.2. The mitigation measures and Forest Plan Standards and Guidelines that would be employed to diminish or eliminate the impacts of sedimentation on water quantity and water quality are the same that would be employed for fisheries. In particular, maintaining 70% crown closure in a 100-foot riparian strip adjacent to perennial streams (as recommended by the Society for the Protection of New Hampshire Forests, 1997), should prevent increased sedimentation to the streams, protect the soils infiltration capacity, maintain shading to minimize any increases in water temperature, and provide for large woody debris recruitment.

Cumulative effects to fisheries are the same as for water quantity and quality (Section 3.7.3). Maintaining large trees adjacent to streams may improve future instream habitat diversity in these streams by promoting recruitment of large woody debris necessary for pool formation (Likens and Bilby 1982). More habitat diversity provides more refuge during floods, helping to stabilize brook trout populations (USDA Forest Service 2001).

3.9 Wildlife

No Issues Related to Wildlife

3.9.1 Wildlife Habitat

3.9.1.1 Affected Environment for Wildlife Habitat

When comparing the DFC for both even- and uneven-aged acres by community type in HMU 213, the overall acres of northern hardwoods are close to the desired level, but spruce-fir and permanent wildlife openings fall well short. When comparing the DFC for both even- and uneven-aged acres by community type in HMU 214, the overall acres of northern hardwoods are again close to the desired level; there is an abundance of aspen and hemlock, and a shortage of paper birch and permanent wildlife openings. With regard to DFC for age class, there is a lack of regenerating stands for all habitat types in both HMUs. Within HMU 213, there is an abundance of overmature northern hardwoods, and lack of overmature age class for all other community types. Within HMU 214, there is an abundance of overmature northern hardwoods and aspen, and a lack of overmature paper birch. (Tables 21 and 22)

In the higher elevations (above 2,500 feet) of both HMUs, no vegetative management is permitted. Within HMU 213, these higher elevation lands comprise nearly 8,500 acres and contain overmature northern hardwood, mixedwood, aspen, paper birch, and spruce/fir. Within HMU 214, these higher elevation lands comprise nearly 6,000 acres and contain overmature northern hardwood, mixedwood, and aspen intermixed with overmature paper birch, spruce/fir, and hemlock.

In 1998, a number of mature and overmature stands of northern hardwoods in the mid-slope elevations of HMU 213 suffered heavy to moderate damage from an ice storm. The weight of the ice shattered branches, large tree limbs, and entire trees within the affected stands; creating openings in the canopy that were extensive in some instances. Within MA 2.1 and 3.1 of HMU 213, 49 acres of northern hardwoods experienced a significant enough loss of canopy to reclassify the stands as regeneration age. The 103 acres of northern hardwoods in HMU 213 classified as regeneration include these 49 acres (see Table 1A in Chapter 1, and Table 21). During the five growing seasons since the ice storm, there has been a substantial increase in understory vegetation in these stands.

The Analysis Area for direct and indirect effects on wildlife habitat is the managed portion (MA 2.1 and 3.1) of HMUs 213 and 214, since this is the portion of these HMUs in which habitat objectives have been established in the Forest Plan. **The Analysis Area for cumulative effects to wildlife habitat** will include all private and public lands within and adjacent to HMUs 213 and 214. An HMU is a building block for the larger wildlife habitat management goals of the 1986 Forest Plan. When vegetative management activities fall within the DFC for a given HMU, the effect cumulatively is that the given HMU contributes to the larger wildlife habitat goals for the National Forest. Non-managed National Forest lands and private lands within the HMU boundaries are considered when analyzing cumulative effects to determine if there are activities taking place elsewhere in the HMU that may affect wildlife habitat. The temporal scope for considering cumulative effects on wildlife habitat is ten years in the past and 10 years in the future. This 20-year time period was chosen because the benefits of regenerating stands diminish after 10 years for some wildlife species.

3.9.1.2 Direct and Indirect Effects on Wildlife Habitat

Summary of Direct & Indirect Effects on Wildlife Habitat

Analysis Area	Time Period	Estimated Acres
National Forest lands designated as MA 2.1 and 3.1 in HMUs 213 and 214	Present	Approximately 10,154 NF acres

Alternative	Summary of Direct & Indirect Effects
1	Natural processes prevail, succession to more mature forest habitat, reduction in regeneration; No effects from logging or road restoration; Continued maintenance of existing wildlife openings
2	The most benefits to early-successional species as a result of even-aged harvest (149 acres); Most acres of summer harvest (up to 656 acres) – could have direct effects to nesting species
3	Fewer benefits to early-successional species, with 33 fewer even-aged acres than Alternative 2; Fewest acres of summer harvest (102 acres) – fewer direct effects to summer nesting species, more direct effects to hibernating or winter breeding species
4	Fewest acres of even-aged harvest (54% of Alternative 3) – fewest benefits to early-successional species; Same summer harvest acres as Alternative 3

Alternative 1: No Action Alternative

There would be no direct or indirect effects from timber harvest and road restoration activities, such as openings in the forest canopy, residual tree damage, snow or soil compaction, or noise from logging or road equipment. Openings in the forest canopy from 1998 ice storm damage would continue to provide opportunities for some early-successional habitat. Any additional openings would result from mortality of individual trees or disturbance from some other natural event (storm, fire, infestation, etc.).

Existing permanent wildlife openings would continue to be maintained through mowing or prescribed burning every 3 to 5 years. Direct effects of fire, mowing, or stumping permanent wildlife openings on wildlife may vary for different species and conditions (Anderson 1994). In general, while some evidence of vertebrate mortality has been reported, the most common opinion is that vertebrates are rarely killed in fires. (Lyon et al. 1978). Mowing or stumping may eliminate soft mast, such as raspberries, or other herbaceous vegetation for one season.

Action Alternatives 2-4

Active timber harvest operations and connected actions, such as road restoration and construction (including replacement of bridges and culverts), increase short-term human access to the Project Area. When operations are active, negative effects could include displacing wildlife, including nesting birds, or altering travel corridors or mobility of some species, including amphibians, small and large mammals. Beneficial effects of harvesting could include increased mobility for some species on snow compacted by skidder traffic, an additional browse for wildlife from residual treetops scattered on the ground. The wildlife report, located in the Peabody Project Record, provides further detail on direct and indirect effects to wildlife habitat.

In units with a clearcut and seed tree cut prescription, site conditions on the forest floor would be hotter and drier for about 2 to 5 years after cutting with increased decomposition of leaf litter (Fay et al. 1994). This could adversely affect some species of amphibians, such as red-backed salamander (deMaynadier and Hunter 1998). Individual salamanders in large unshaded openings would not likely survive. Amphibians and small mammals in clearcuts also might be more vulnerable to predation. This would be partially mitigated by leaving reserve patches of trees throughout these units.

The season in which a unit is harvested may directly affect wildlife, especially during critical times of a species' life cycle. Breeding, rearing of young, feeding, and winter survival are critical times common to most species. Individuals could be displaced, harassed or mortally affected during any season of operation. Summer harvest (June through July) could affect species that utilize trees for nesting, cover, and foraging (such as breeding birds) and ground dwelling species (mammals, amphibians and reptiles). Fall harvest (August to October) would affect fewer nesting species but potentially could affect autumn breeding species including some amphibians, mast feeding species such as black bear, and small ground-dwelling mammals. Certain species could be affected by winter harvest (December through March). Some species, including owls, breed in winter. White-tailed deer gather, or "yard", in areas of lowland conifers in the winter, where cover and warmer temperatures provide protection from the elements, and where they would also be vulnerable to disturbance during this time of year. Species, which utilize cavities in winter, such as chickadees and nuthatches; or species which den, such as squirrels and raccoons, could be affected if roost or cavity trees were harvested. Raptors start to breed in February, with young fledging in June and July (SPNHF 1997), so they could be affected by both winter and summer harvest.

In proposed clearcut and seed tree cuts, there would be a lack of larger dead and down wood (>11" DBH) between 10 and 60 years. Residual trees in all other harvest units

would continue to supply a component of standing and down woody material as trees die, branches break, and annual litter buildups on the ground. Forest Plan Standards and Guidelines, as well as mitigation measures described in Appendix D, would retain wildlife trees in harvest units for future large cavity trees and dead/down wood. This, in conjunction with the abundance of mature habitat within the managed and unmanaged portions of these HMUs, should ensure that an adequate amount of cavity trees and dead and down wood is available for wildlife associated with these habitat features.

No whole tree harvesting would be allowed in any units. Whole trees would be dragged to the landing, limbed, and the tops dragged back in the woods. This practice would provide a one time input of treetops and branches. Some species such as moose and white-tailed deer could make use of this browse during the winter months.

Alternative 2: Original Proposed Action

Of the Action Alternatives, Alternative 2 would have the greatest impact on wildlife in summer and fall, since it permits harvest during these periods on up to 663 acres. Alternative 2 would also have the greatest impact on amphibians and small mammals vulnerable to increased sunlight and predation in temporary openings, since it proposes the most even-aged regeneration harvest (139 acres) and new wildlife openings (10 acres). Alternative 2 best meets the objectives of the Forest Plan for wildlife habitat within HMUs 213 and 214 (Tables 21 and 22).

Alternative 3: Modified Proposed Action

Alternative 3 has 123 fewer acres of timber harvest than Alternative 2, including 32 fewer acres of even-aged regeneration harvest and one less acre of new wildlife opening. In addition, Alternative 2 permits summer harvest on only 102 acres. This reduced even-aged and summer harvest means Alternative 3 would have less impact on nesting wildlife and on amphibians and small mammals vulnerable to increased sunlight and predation in temporary openings than Alternative 2. Alternative 3 would meet less of the Forest Plan wildlife habitat DFC for HMUs 213 and 214 than Alternative 2 (Tables 21 and 22) - proposing 20 fewer acres of northern hardwoods regeneration, 141 fewer acres of softwood enhancement in HMU 213, and 12 fewer acres of aspen and paper birch regeneration in HMU 214 (Tables 21 and 22).

Alternative 4: Reduced Even-Aged Management

Alternative 4 proposes the same operating restrictions on season of harvest as Alternative 3. Alternative 4 would have the least impact of the Action Alternatives on amphibians and small mammals vulnerable to increased sunlight and predation in temporary openings, since it proposes the fewest acres of even-aged regeneration harvest (54 acres). With the fewest acres of regenerating stands, Alternative 4 meets less of the Forest Plan wildlife habitat DFC for HMUs 213 and 214 than Alternatives 2 and 3 (Tables 21 & 22). The effects to softwood habitat, aspen regeneration, and permanent wildlife openings would be similar to Alternative 3.

Table 21. Summary of Wildlife Habitat Objectives for HMU 213, by Action Alternatives

	Community	Northern Hardwoods			Spruce-Fir			Wildlife Openings		
HMU 213										
Regeneration Age Class	Existing	103			0			101		
	Desired	143			43			194		
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	143	123	103	0	0	0	107	107	107
Young Age Class	Existing	490			0					
	Desired	499			108					
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	490	490	490	0	0	0			
Mature Age Class	Existing	681			25					
	Desired	641			239					
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	651	671	671	25	25	25			
Overmature Age Class	Existing	694			0					
	Desired	143			43					
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	681	681	691	0	0	0			
Uneven- Aged	Existing	3112			480					
	Desired	2737			1110					
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	3109	3109	3109	480	480	480			
<p>NOTE: Spruce-fir regeneration is promoted through uneven-aged management on 250 acres in Alternative 2, and on 104 acres in Alternatives 3 and 4. This includes treatment of spruce-fir stands 33/41 and 34/13B in all alternatives, and release of spruce-fir regeneration through group overstory removal in northern hardwoods and mixedwood stands 33/58 and 33/59 in Alternative 2, and 34/50 in all alternatives.</p>										

Table 22. Summary of Wildlife Habitat Objectives for HMU 214, by Action Alternatives

	Community	Northern Hardwoods			Aspen			Paper Birch			Hemlock			Wildlife Openings		
HMU 214																
Regeneration Age Class	Existing	0			0			0						14		
	Desired	119			26			34						117		
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	45	45	25	20	15	15	34	27	14				18	17	17
Young Age Class	Existing	297			199			0								
	Desired	416			76			153								
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	297	297	297	199	199	199	0	0	0						
Mature Age Class	Existing	767			0			39								
	Desired	536			51			119								
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	726	732	732	0	0	0	39	39	39						
Overmature Age Class	Existing	697			46			0								
	Desired	119			17			34								
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	682	682	682	46	46	46	0	0	0						
Uneven-Aged	Existing	842			0			29			875					
	Desired	1218			0			0			88					
	Alternative	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
	Objective	815	815	825	0	0	0	9	16	29	875	875	875			

NOTE: For all alternatives, where paper birch is found in the understory of hardwood stands 42/3 and 42/6, group selection would promote regeneration of paper birch by removing overstory and leaving seed trees in place; where hemlock is found in the understory of hardwood stands 42/1, 42/5 and 42/6, group selection would promote release of hemlock by removing overstory.

3.9.1.3 Cumulative Effects on Wildlife Habitat

Summary of Cumulative Effects on Wildlife Habitat		
Analysis Area	Time Period	Estimated Acres
All private and public lands within and adjacent to HMUs 213 and 214	1993-2003 Present 2003-2013	Approximately 29,955 acres of public and private lands

Alternative	Summary of Cumulative Effects
1	Natural processes prevail, succession overall to more mature forest habitat, reduction in regeneration age class; No effects from logging or road restoration; Continued maintenance of existing wildlife openings; Loss of habitat diversity
2	Enhances or retains structural, species and age diversity in wildlife habitat; Proposes most acres of even-aged harvest to promote regeneration age class (139 acres), the most acres of wildlife opening expansion (10 acres), and the most acres where softwood enhancement is emphasized (438 acres)
3	Proposes 107 acres of even-aged harvest to promote regeneration age class, 9 acres of wildlife opening expansion, and 292 acres where softwood is emphasized
4	Proposes 54 acres of even-aged harvest to promote regeneration age class, 9 acres of wildlife opening expansion, and 292 acres where softwood is emphasized

Past, present and foreseeable future activities within the cumulative effects Analysis Area for wildlife habitat are the same as those described in detail in Section 3.2, Vegetation.

Alternative 1: No Action Alternative

Mature and overmature northern hardwoods, in even-aged and uneven-aged stands, dominate the Analysis Area, and they would continue to do so in this Alternative. Those stands currently in a regeneration age class as a result of even-aged timber harvest or natural disturbance over the past 10 years (Table 13), will have aged into young saplings over the next 10 years, and lost some of the attributes that make them beneficial to wildlife as early-successional habitat. With no timber harvest anticipated on National Forest lands within the Analysis Area over the next 10 years, the cumulative effect of Alternative 1 on MA 2.1 and 3.1 lands would be the loss of age, species and structural diversity. This alternative would continue fall short of meeting the need for maintaining diversity for the full range of wildlife species that inhabit the National Forest, and show an overall decline in the regeneration age class. Early-successional habitat types such as paper birch and aspen would still be present in 10 years, but they would have matured and possibly begun converting towards northern hardwoods or softwood types.

Openings in the forest canopy from 1998 ice storm damage would continue to provide opportunities for some regeneration of early-successional species. Dead or dying trees or small groups of trees may continue to fall to the ground and open limited portions of forest floor to sunlight and regeneration.

Forest management activities on private lands inside and outside of the National Forest proclamation boundary have provided limited emphasis on even-aged regeneration harvest. The largest adjacent landowner, Wagner Forest Products, is planning no additional timber harvest on lands within a mile of the National Forest within their current planning horizon (5-6 years). And private lands cleared for residential development on the Stony Brook tract do not contribute to age class diversity in a forested landscape.

Action Alternatives 2-4

All of the Action Alternatives will seek to maintain diversity for the full range of wildlife species that inhabit the National Forest by regenerating stands of northern hardwoods, aspen and paper birch and enhancing the softwood components or understory of hardwoods stands. Each of the Action Alternatives will continue to fall short of the DFC for regeneration age class (Tables 13, 21 & 22), and each will continue to be dominated by mature and overmature northern hardwoods. Roads would be gated to vehicular access upon completion of any proposed timber harvest, so none of the Action Alternatives would likely cause an increase in long-term effects to wildlife from interaction with humans beyond that which already exists.

Alternative 2 proposes the most acres of regeneration age class (139 acres), the most acres of wildlife opening expansion (10 acres), and the most acres where softwood enhancement is emphasized (438 acres in 8 mixedwood, hardwoods and softwood stands). Alternative 4 proposes the fewest acres of regeneration age class (54 acres). Alternatives 3 and 4 offer the same amount of wildlife opening expansion (9 acres) and acres where softwood enhancement is emphasized (292 acres in 6 hardwoods and softwood stands). (Tables 21 & 22).

There are concerns that even-aged harvest methods may fragment existing mature habitat and cause forest interior birds, such as wood thrush to be more vulnerable to increased predation from nest predators such as brown-headed cowbirds, blue jays, red squirrels, and raccoons. There would be what some call a form of fragmentation within HMUs 213 and 214 over time, as regeneration harvests occur in different stands. However, research has found no evidence of the negative aspects of forest fragmentation exhibited in isolated forest environments in large forested areas where active timber harvesting occurs (Askins et al. 1990, Askins 1993, DeGraaf and Healy 1988, Thompson et al. 1992, Yamasaki et al. 2000). The White Mountain National Forest and most surrounding private land are well forested. Suitable habitat for forest interior wildlife species, such as wood thrush, should be maintained under this Alternative. Effects of timber harvesting on wildlife are in large part mitigated by application of Standards and Guidelines listed in the Forest Plan in Chapter III and in Chapter VII, pages 18 –22 of Section B, and the Forest Plan Amendment (USFS 2001c), as well as specific mitigation measures described in this section.

3.9.2 Management Indicator Species and Other Species of Concern

3.9.2.1 Affected Environment for MIS and Other Species of Concern

Regulations developed in 1982 to implement the National Forest Management Act directed National Forests to identify **Management Indicator Species (MIS)** to monitor the effects of management activities on wildlife habitat. The White Mountain National Forest Plan selected Management Indicator Species that showed “a strong indication of an existing or definable population-habitat relationship”; appeared, as a group, “to cover the range of habitat conditions” found within the National Forest; and “whose population changes are believed to be a result of management activities”. The Forest Plan selected MIS for representative community types on lands with and without active vegetation management and for endangered and threatened status. A full discussion of MIS, how they were selected, and how they relate to management activities can be found in Appendix B of the Forest Plan (VII-B, pp 1-28).

Monitoring guidelines for wildlife are found in the Forest Plan (Chapter IV-12). Habitat condition and MIS are monitored Forest-wide, with results compiled and evaluated in annual Forest monitoring reports (USFS 1993, 1994, 1995, 1996, 1998, 1999, 2000).

Table 23 identifies MIS on the National Forest and whether the indicator habitat occurs or has potential to occur in the Project Area. **The Analysis Area for direct and indirect effects on MIS** is the Project Area, which includes stands proposed for some type of vegetative management, as well as the area associated with connected actions (roads and landings). Representative indicator community types exist or have potential to exist in the Project Area for eleven of the twenty-five MIS: chestnut-sided warbler, Northern goshawk, broad-winged hawk, ruffed grouse, white-tailed deer, snowshoe hare, Cape May warbler, mourning warbler, brook trout, American marten and Canada lynx. Habitat requirements and limiting factors are described in reference USFS 2001. Effects to Brook trout are discussed in Section 3.8, Fisheries, and effects to Canada lynx are discussed in Section 3.10, TEP/RFSS and Rare Communities.

The Analysis Area considered for cumulative effects on MIS population trends is the “Focus of Analysis” area described in the report written on the Management Indicator Species and population viability for the White Mountain National Forest (USFS 2001a). The temporal scope for MIS is 10 years past and 10 years future, chosen because the benefits of regeneration age class for some wildlife species diminish after 10 years.

In addition to the MIS described in the Forest Plan, the White Mountain National Forest conducted a **Species Viability Evaluation (SVE)** in 2002 for plant and animal species that might have potential viability concern on the Forest (USFS 2003). Through the SVE process, a list was developed of 49 species that are likely to occur on the Forest whose viability, either within their entire range or only within the National Forest, is a concern now or in the next 20 years; or whose viability might become a concern depending on factors that management of the National Forest could impact. These species are referred to as “**Species of Concern**”, and the list is found in Appendix B of this EA.

Twelve plant species on the list may have suitable habitat in the Project Area; however none of these species were detected during field reviews of or adjacent to the Project Area (New Hampshire Natural Heritage Inventory, NHNHI 1992, Sperduto and Engstrom 1993, Engstrom and Sperduto 1994, Sperduto 1995, Nichols and Sperduto 1996, Crowley 2000, Engstrom personal communication 2003). Two wildlife species have suitable habitat in the Project Area: the bay-breasted warbler and American marten. Habitat requirements and limiting factors for American marten and bay-breasted warbler are discussed in reference USFS 2003. The American marten is addressed in the MIS Table (Table 23). The bay-breasted warbler is addressed below.

The Analysis Area considered for direct, indirect and cumulative effects to Other Species of Concern is the same as for MIS.

3.9.2.2 Direct and Indirect Effects on Management Indicator Species

Table 23 lists the indirect effects on MIS species that may occur in the Project Area. Further detail can be found in the Wildlife report (project file). The presence of suitable habitat does not guarantee the presence of a MIS species nor does the lack of suitable habitat foreclose a species from being present. For this analysis, the presence of habitat is used to as an indicator for a species' presence and effect on population trend.

3.9.2.3 Direct and Indirect Effects on Other Species of Concern

Alternative 1 would maintain the existing mature softwoods and mixedwood habitat which is favored by bay-breasted warbler. The Action Alternatives would maintain and enhance the existing mature and overmature character of softwoods and mixedwoods habitat in the Project Area, providing habitat for bay-breasted warbler. Alternative 2 proposes to release softwood regeneration where possible through individual tree and group selection of hardwoods overstory on 339 acres, and group selection in softwood stands on 99 acres (Tables 21 & 22). Alternatives 3 and 4 propose to enhance softwood regeneration through removal of hardwoods overstory where possible through individual tree and group selection of hardwoods overstory on 193 acres, and group selection in softwood stands on 99 acres. Implementation of these Alternatives are expected to maintain current population levels of bay-breasted warbler.

3.9.2.4 Cumulative Effects on Management Indicator Species and Other Species of Concern

Cumulative effects for MIS are detailed in the Wildlife report in the Project Planning Record. None of the Alternatives are expected to jeopardize MIS species viability.

Habitat favored by the bay-breasted warbler (Species of Concern) would be maintained and continue to mature in the Analysis Area for all alternatives. Breeding bird survey data (1980-1994) showed a continent-wide 12.2% decrease for the bay-breasted warbler. White Mountain National Forest breeding bird surveys showed a mean number of 2 individuals per 15 point transect in 1997, and a mean less than 1 in 1992-96 and 1998-99 (USFS 2003). This type of fluctuation has been tied to spruce budworm outbreaks. None of the Alternatives is expected to decrease population levels of bay-breasted warbler.

Table 23. Management Indicator Species in Project Area.
See last page of table for explanation of abbreviated headings

Management Indicator Species	Age Class and Representative Habitat	Habitat Present or Potential	Status	RPT	FHT	Expected Changes to Existing Habitat Condition from Project Implementation			
						Alternative 1	Alternative 2	Alternative 3	Alternative 4
Chestnut-sided warbler <i>Dendroica pensylvanica</i>	Regeneration (0-9yrs old) Northern Hardwood & Mixedwood	Yes	Suspect	Declining	Declining	No Change	HMU 213 – Regen (+) 40 ac HMU 214 – Regen (+) 40 ac	HMU 213 – Regen (+) 20 ac HMU 214 – Regen (+) 45 ac	HMU 213 – No change HMU 214 – Regen (+) 25 ac
Northern Goshawk <i>Accipiter gentilis</i>	Mature and Overmature (60+ yrs old)) Northern Hardwood & Mixedwood	Yes	Document	Un-common but Stable	Mature and Overmature Hardwood Age Class Increasing	No Change	HMU 213 – Nesting Habitat (-) 46 ac HMU 214 – Nesting Habitat (-) 83 ac	HMU 213 – Nesting Habitat (-) 26 ac HMU 214 – Nesting Habitat (-) 77 ac	HMU 213 – Nesting Habitat (-) 6 ac HMU 214 – Nesting Habitat (-) 57 ac
Broad-winged Hawk <i>Buteo platynerus</i>	Mature and Overmature Paper Birch & Aspen Aspen: 40+ yrs Birch: 50+ yrs	Yes	Suspect	Stable	Mature Age Class decreasing; Overmature Age Class Somewhat Stable	No Change	HMU 213 – No Change HMU 214 – <i>Present:</i> Nesting Habitat (-) 20 ac <i>Future:</i> Nesting Habitat (+) 34 ac; Paper Birch Component (+) 154 ac	HMU 213 – No Change HMU 214 – <i>Present:</i> Nesting Habitat (-) 13 ac <i>Future:</i> Nesting Habitat (+) 27 ac; Paper Birch Component (+) 161 ac	HMU 213 – No Change HMU 214 – <i>Present:</i> Nesting Habitat No Change <i>Future:</i> Nesting Habitat (+) 14 ac; Paper Birch Component (+) 174 ac

Table 23. Management Indicator Species in Project Area.
See last page of table for explanation of abbreviated headings

Management Indicator Species	Age Class and Representative Habitat	Habitat Present or Potential	Status	RPT	FHT	Expected Changes to Existing Habitat Condition from Project Implementation			
						Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ruffed Grouse <i>Bonasa umbellus</i>	All Ages Classes of Aspen & Regeneration and Young (0-49 yrs) Paper Birch	No	Suspect	Declining or uncertain	Paper Birch & Aspen Regen Age Class Decreasing Young Age Classes Increasing	No Change	HMU 213 – No Change HMU 214 – Aspen Regen (+) 20 ac Paper Birch Regen (+) 34 ac; Paper Birch Component (+) 154 ac	HMU 213 – No Change HMU 214 – Aspen Regen (+) 15 ac Paper Birch Regen (+) 27 ac; Paper Birch Component (+) 161 ac	HMU 213 – No Change HMU 214 – Aspen Regen (+) 15 ac Paper Birch Regen (+) 14 ac; Paper Birch Component (+) 174 ac
Rufous-sided Towhee <i>Pipilo erythrophthalmus</i>	Regeneration or Young Oak or Oak/Pine (0-59 yrs)	No	No	Declining	Decreasing	No Change	No Change	No Change	No Change
Gray Squirrel <i>Sciurus carolinensis</i>	Mature and Overmature Oak or Oak/Pine (60 + yrs)	No	No	Stable	Stable	No Change	No Change	No Change	No Change
Northern Junco <i>Junco hyemalis</i>	Regeneration and Young Pine (0-69 yrs)	No	No	Slight decline	Decreasing	No Change	No Change	No Change	No Change
Pine Warbler <i>Dendroica pinus</i>	Mature and Overmature Pine (70+ yrs)	No	No	Increasing	Stable	No Change	No Change	No Change	No Change

Table 23. Management Indicator Species in Project Area.
See last page of table for explanation of abbreviated headings

Management Indicator Species	Age Class and Representative Habitat	Habitat Present or Potential	Status	RPT	FHT	Expected Changes to Existing Habitat Condition from Project Implementation			
						Alternative 1	Alternative 2	Alternative 3	Alternative 4
White-tailed Deer <i>Odocoileus virginianus</i>	All Ages Hemlock During Deep-snow Winters.	Hemlock part of stands in Comp 42	Document	Stable	Stable to decreasing	No Change	HMU 213 – No Change HMU 214 – Release Hemlock in 188 acres of Hardwoods	HMU 213 – No Change HMU 214 – Release Hemlock in 188 acres of Hardwoods	HMU 213 – No Change HMU 214 – Release Hemlock in 188 acres of Hardwoods
Snowshoe Hare <i>Lepus americanus</i>	Regeneration or Young Spruce, Spruce/Fir and Fir (0-39 yrs)	No/Yes	Suspect	Stable to increasing	Decreasing	No Change	HMU 213 – 12 ac Group Cuts in 72 ac Spruce/Fir, Release Spruce/Fir in 178 ac of Hardwood & Mixedwood HMU 214 – No S/F	HMU 213 – 12 ac Group Cuts in 72 ac Spruce/Fir, Release Spruce/Fir in 32 ac of Hardwoods HMU 214 – No S/F	HMU 213 – 12 ac Group Cuts in 72 ac Spruce/Fir, Release Spruce/Fir in 32 ac of Hardwoods HMU 214 – No S/F
Cape May Warbler <i>Dendroica tigrina</i>	Mature and Overmature Spruce, Spruce/Fir and Fir (40+ yrs)	Yes	Suspect	Stable, fluctuate with spruce budworm outbreaks	Increasing	No Change	HMU 213 – Mature Spruce/Fir (-) 12 ac Promotes Spruce/Fir (+) 178 ac HMU 214 – No Change	HMU 213 – Mature Spruce/Fir (-) 12 ac Promotes Spruce/Fir (+) 32 ac HMU 214 – No Change	HMU 213 – Mature Spruce/Fir (-) 12 ac Promotes Spruce/Fir (+) 32 ac HMU 214 – No Change

Table 23. Management Indicator Species in Project Area.
See last page of table for explanation of abbreviated headings

Management Indicator Species	Age Class and Representative Habitat	Habitat Present or Potential	Status	RPT	FHT	Expected Changes to Existing Habitat Condition from Project Implementation			
						Alternative 1	Alternative 2	Alternative 3	Alternative 4
Eastern Kingbird <i>Tyrannus tyrannus</i> Eastern Bluebird <i>Sialia sialis</i>	Upland Openings – Grass, Forbs, Orchard	No	No	Declining Increasing	Stable to Decreasing	No Change	No Change	No Change	No Change
Mourning Warbler <i>Oporornis philadelphia</i>	Upland Openings-Shrub, Forest Ecotone	Yes	Suspect	Stable	Decreasing	No Change	HMU 213 – Wildlife Opening (+) 6 ac HMU 214 – Wildlife Opening (+) 4 ac	HMU 213 – Wildlife Opening (+) 6 ac HMU 214 – Wildlife Opening (+) 3 ac	HMU 213 – Wildlife Opening (+) 6 ac HMU 214 – Wildlife Opening (+) 3 ac
Black Duck <i>Anas rubripes</i>	Wetlands and Water	No	No	Declining	Fluctuates with Beaver Activity	No Change	No Change	No Change	No Change
Brook Trout <i>Salvelinus fontinalis</i>	Permanent Lakes, Ponds, Streams	Yes	Document	Stable	Stable	No Change	No Change	No Change	No Change
American Peregrine Falcon <i>Falco peregrinus</i>	Cliffs and Talus	No	No	Increasing	Stable	No Change	No Change	No Change	No Change

Table 23. Management Indicator Species in Project Area.
See last page of table for explanation of abbreviated headings

Management Indicator Species	Age Class and Representative Habitat	Habitat Present or Potential	Status	RPT	FHT	Expected Changes to Existing Habitat Condition from Project Implementation			
						Alternative 1	Alternative 2	Alternative 3	Alternative 4
American Marten <i>Martes americana</i>	At least 80% of their home range must have forest that is 30+' tall with at least 80 ft² of basal area	Yes	Suspect	Increasing	Increasing	No Change	HMU 213 – Habitat Suitability: Potential of (-) 6%. HMU 214 – Habitat Suitability: Potential of (-) 6%.	HMU 213 – Habitat Suitability: Potential of (-) 5%. HMU 214 – Habitat Suitability: Potential of (-) 6%.	HMU 213 – Habitat Suitability: Potential of (-) 5%. HMU 214 – Habitat Suitability: Potential of (-) 6%.
Osprey <i>Pandion haliaetus</i>	Large water bodies	No	No	Increasing	Stable	No Change	No Change	No Change	No Change
Common Loon <i>Gavia immer</i>	Large water bodies	No	No	Increasing	Stable	No Change	No Change	No Change	No Change
Sunapee Trout <i>Salvelinus aureolus</i>	Deep cold water bodies with shallow gravel bars	No	No	Considered Extirpated from WMNF	Stable	No Change	No Change	No Change	No Change
Robbin's Cinquefoil <i>Potentilla robbinsiana</i>	Alpine	No	No	Stable to Increasing; Delisted in 2002	Stable	No Change	No Change	No Change	No Change

Table 23. Management Indicator Species in Project Area.
See last page of table for explanation of abbreviated headings

Management Indicator Species	Age Class and Representative Habitat	Habitat Present or Potential	Status	RPT	FHT	Expected Changes to Existing Habitat Condition from Project Implementation			
						Alternative 1	Alternative 2	Alternative 3	Alternative 4
Canada Lynx <i>Lynx canadensis</i>	Dense Softwoods	Yes	No	Considered Extirpated from WMNF	Increasing	No Change	HMU 213 – Enhance Spruce/Fir: 250 ac HMU 214 – Promote Hemlock: 188 acres.	HMU 213 – Enhance Spruce/Fir: 104 ac HMU 214 – Promote Hemlock: 188 acres	HMU 213 – Enhance Spruce/Fir: 104 ac HMU 214 – Promote Hemlock: 188 acres
Bicknell's Thrush <i>Catharus bicknelli</i> Blackpoll Warbler <i>Dendroica striata</i>	High Elevation Spruce/Fir	No	No	Declining Stable Fluctuates with spruce budworm outbreaks	Stable	No Change	No Change	No Change	No Change

Key to Table 25 Abbreviated Headings;

- **Habitat Present or Potential** – Habitat is present in Project Area or has potential to occur in Project Area
- **Status** – Management Indicator Species is either Documented or Suspected (or neither of the two) within the Project Area
- **RPT** - Regional Population Trend (From: USFS. 2001a. Evaluation of Wildlife Monitoring and Population Viability WMNF Management Indicator Species. White Mountain National Forest, Laconia, NH. 37pp.)
- **FHT** - Forest-wide Habitat Trend – (From: USFS. 1993. 1994. 1996. Monitoring Reports, White Mountain National Forest, Laconia, NH and USFS. 2003. CDS database Engstrom, B. Spring 2003. Personnel observation of nesting goshawk. Contract botanist, Marshfield, VT. USFS. 2001b. Analysis of the Management Situation for Wildlife, White Mountain National Forest, Laconia, NH Thompson et. al. 2001)

3.9.3 Habitats of Concern

Four types of habitat are considered: exemplary communities, vernal pools/seeps, bear-clawed beech trees, and deer wintering areas (deer yards). **The Analysis Area for direct and indirect effects to these habitats** is the Project Area, including stands proposed for treatment and the connected actions that facilitate treatment (roads, landings, etc.). **The Analysis Area for cumulative effects to these habitats** is the public and private lands within and adjacent to HMUs 213 and 214. The temporal scale is 10 years past and 10 years future. To facilitate cumulative effects analysis, it is assumed that residential development will have adverse effects to Habitats of Concern.

3.9.3.1 Exemplary Communities

A landscape analysis and/or field reviews have been conducted for exemplary communities within or near the Project Area (NHNHI 1992, Sperduto and Engstrom 1993, Engstrom and Sperduto 1994, Sperduto 1995, Nichols and Sperduto 1996, Crowley 2000). No exemplary communities were documented in the Project Area (proposed timber harvest units), although some were identified in the Analysis Area (HMUs 213 and 214), including the high energy riverbank communities along the Peabody and Moose Rivers, an acidic riverside seep near the Moose River, acidic mixedwood seeps next to drainages and scattered on steep slopes in Compartment 40, and an exemplary northern hardwood area in Compartment 40. Some areas of enrichment may occur east of Pine Mountain in the vicinity of the Pinkham B Road.

There would be no direct, indirect or cumulative effects on exemplary communities from any of the Alternatives since none occur within the Project Area.

3.9.3.2 Vernal Pools/Seeps

Vernal pools are valuable habitat to certain species of amphibians and reptiles; and seeps provide a source of water for wildlife during winter months, as well as providing habitat for rare plants (Tappan 1997, Taylor et al. 1996, Society for Protection of New Hampshire Forests 1997, Carlson and Sweeney 1999). Seeps and vernal pools most likely would form in low lying areas with compacted sediments or underlying ledge where drainage is poor. Stands 33/41, 33/42, 33/59, 34/10, 34/13, 40/19, 40/35, 40/102, are located on ELTs 115A, 15J or 115G. These ELTs are characterized by soils with compacted sediment and would most likely have vernal pools or seeps. During field visits by New Hampshire Natural Heritage Inventory to the Analysis Area, wet seepy areas were recorded near drainages adjacent to Stands 33/4 and 33/5, and along the steeper slopes in Compartment 40 (Bechtel 1999, Crowley 2000). Field visits to the area by Forest Service staff during project review found wet seepy areas in Stands 33/4, 33/5, 33/41, 34/10, 34/13, and 40/19.

The No Action Alternative would have no direct or indirect effects on vernal pools or seeps, but there could be direct effects from the Action Alternatives. While riparian areas

and any known wet sites are excluded from the harvest area, there is a risk of impacting unidentified wetlands such as vernal pools and seeps.

Leaving excessive slash and skidding in and adjacent to vernal pools or seeps could affect the hydrologic function of these areas and impede animal movements. Harvesting adjacent to vernal pools could reduce leaf litter and shade to vernal pools eliminating organic matter input and elevating water temperatures. Mitigation measures described in Section 3.8.1 should mitigate these potential effects and minimize the probability of affecting unidentified vernal pools or seeps.

Cumulative Effects on Vernal Pools/Seeps

Past harvesting in HMUs 213 and 214 should have followed Forest Plan Standards and Guidelines to protect seeps. Forest Plan Standards and Guidelines (Forest Plan Chapter III–19), including Best Management Practices, and mitigation measures listed in Appendix D should protect seeps and vernal pools during present harvesting. No harvesting is anticipated on National Forest lands over the next 10 years. The potential for present or future human presence to impact vernal pools or seeps is considered small as few of these areas occur near trails or roads, and future routes would avoid wet areas.

3.9.3.3 Bear-clawed Beech Trees

Black bear use a diversity of habitats to obtain a source of green vegetation in the spring, berries and insects during the summer, and hard mast, such as acorns or beechnuts, during the fall (Rogers and Allen 1987). Since beech is a primary hard mast producer in the northern portion of the White Mountain National Forest, areas with concentrations of bear-clawed beech are considered critical habitat for this species. Evidence of bear-clawed beech was noted in Stands 33/42, 33/58, 34/10, 34/13, 33/71, 42/4 during field reviews of the Project Area.

Alternative 1 would have no direct or indirect effects on bear-clawed beech trees. For the Action Alternatives, there could be direct effects from harvesting during the fall season when bears might be present. Most likely bears would be temporarily displaced to adjacent northern hardwoods stands during active harvesting. Alternative 2 (663 acres) has much more potential for fall harvest than Alternatives 3 and 4 (102 acres).

Indirect effects of harvesting could be a reduction in fall foraging habitat from the removal of bear-clawed beech trees. This effect would be mitigated in harvest units by reserving most beech trees with an abundance of claw marks. There is also an abundance in these HMUs of mature and overmature northern hardwoods with a beech component.

Cumulative Effects on Bear-clawed Beech Trees

Of the 428 acres harvested in HMUs 213 and 214 over the past 10 years, 250 acres, or approximately 0.9% of the HMUs, were even-aged cuts (clearcut or shelterwood cut). The balance of the HMUs is dominated by mature and overmature northern hardwoods,

which would be expected to harbor components of beech trees for hard mast. Mitigations for harvesting proposed in the Action Alternatives would defer high concentrations of bear-clawed beech trees, and protect heavily scarred individual trees in harvest units. Connected actions related to this project would not affect bear scarred beech trees. Residential development near Stony Brook may indiscriminately remove bear-clawed beech trees when clearing for roads and housing lots. And the presence of human habitation in close proximity to bear habitat may result in individual bears being relocated due to conflicts.

3.9.3.4 Deer Wintering Habitat

The State of New Hampshire recommends managing deer wintering habitat by interspersing mature softwoods with small openings to perpetuate critical softwood cover, maintain high quality browse production, and ensure deer mobility throughout an area during the harsh winter months (SPNHF 1997, W. Staats personal communication).

There are no documented deeryards within HMU 213 or HMU 214. Peabody Mountain is a documented deer wintering area just north of HMU 213 on private land. Historically, it included approximately 500 acres and supported an undetermined number of deer. This yard is actively used by deer in the winter. Deer activity was observed in Stand 33/41, 33/42, 33/58, and 42/6 during field reviews of the Project Area.

Alternative 1 would have no direct or indirect effects on deer wintering habitat. The Action Alternatives would have no direct effects on wintering habitat, since deer are not wintering in the Project Area. In the short-term, timber harvest would benefit deer by providing an increased source of browse. In the long-term, removal of individual trees and groups of overstory hardwoods in hardwoods and mixedwood stands where there is a softwood understory will enhance the softwood regeneration, possibly providing winter cover for deer in the future. Alternative 2, with softwood enhancement on 438 acres, has the greatest potential for future cover. Alternatives 3 and 4 propose softwood enhancement on 292 acres (Tables 21 & 22).

Cumulative Effects on Deer Wintering Habitat

Forest Plan Standards and Guidelines to protect documented deer wintering habitat (Forest Plan -III-18) and to maintain mature and overmature softwood habitat (Forest Plan- III-13) should ensure that deer wintering habitat is maintained across the forest. Connected actions related to this project would not affect deer wintering habitat. If snowmobile use increases in the future, it may affect deer wintering north of Compartment 33. The effects of snowmobiles on wintering deer are variable (Dorrance et al. 1975, Richens and Lavigne 1978).

3.9.5 Invasive Plants

3.9.5.1 Affected Environment for Invasive Plants

The White Mountain National Forest has been working with The New England Wildflower Society to determine species and locations of non-native invasive plant species. Findings to date have produced a list of invasive species that exist on or near the National Forest. The majority of locations observed have been on the perimeter of the National Forest, primarily along roads, highways and in developed areas such as towns, residential areas and recreation areas.

Presidential Executive Order 13112 (February 3, 1999) directs stewards of all federal lands to protect said lands from introduction of invasive species and to provide for their control. No invasive plants have been reported within the Project Area; however there are at least 8 species of plants in the general vicinity of the Project Area that are considered invasive, including Asiatic bittersweet, black locust, burning bush, coltsfoot, morrow honeysuckle, Norway maple, Japanese barberry, and Japanese knotweed (WMNF database, Map in Project Planning Record). Invasive plants can spread to other disturbed habitats by wind, water, wildlife, humans or vehicles transporting seeds or vegetative parts of the plant.

The Analysis Area for direct and indirect effects to invasive species is the Project Area, including stands proposed for treatment and the connected actions that facilitate treatment (roads, landings, etc.). The Analysis Area for cumulative effects to invasive species is the public and private lands within and adjacent to HMUs 213 and 214. The temporal scale is 10 years past and 10 years future. For cumulative effects analysis, it is assumed that residential development and roads open to vehicular traffic may introduce and/or spread invasive species.

3.9.5.2 Direct and Indirect Effects on Invasive Plants

There is potential for invasive plants to spread into the Project Area along existing roads and other disturbed habitats such as gravel pits and recreation sites. Alternative 1 would not introduce new migration routes or sites for invasive species. Heavy equipment used for timber harvest and road restoration in the Action Alternatives could spread invasive species into harvest areas and along roadways. A mitigation to reduce this potential is to clean logging equipment prior to mobilizing it into the Project Area.

The potential for invasive species to migrate into the Project Area from surrounding areas (Map in Project Planning Record) is greatest in clearcuts, patch cuts, and seed tree cuts, where the canopy is removed. The risk of migration is greatest for 1-2 years after harvesting, when native plant species are just starting to revegetate the sites. Alternative 2 would create the most clearcuts, patch cuts, and seed tree cuts. To help mitigate the spread of invasive species, a 50- to 100-foot buffer of vegetation would be maintained between proposed clearcuts, patch cuts and seed tree cuts, and adjacent roads and trails.

3.9.5.2 Cumulative Effects on Invasive Plants

Most known locations of invasive species are in developed landscapes surrounding the Analysis Area. These known populations do not appear to be expanding into adjacent forested habitats, due to the inherent stability of closed-canopy ecosystems; however, that could change with the introduction of disturbance into these systems. The cumulative effect of timber harvest, particularly even-aged harvest, and the Stony Brook residential development is to increase the risk of introducing invasive species into the HMUs.

3.10 Federal Threatened, Endangered & Proposed Species (TEPS), Regional Forester Sensitive Species (RFSS), and Rare Communities

No Issues Related to Federal Threatened, Endangered & Proposed Species (TEPS), Regional Forester Sensitive Species (RFSS), and Rare Communities

3.10.1 Affected Environment for TEPS, RFSS and Rare Communities

New Hampshire Natural Heritage Inventory (NHNHI) conducted a landscape analysis and/or field reviews within or near the Project Area between 1992 and 1999 (NHNHI 1992, Sperduto and Engstrom 1993, Engstrom and Sperduto 1994, Sperduto 1995, Nichols and Sperduto 1996, Bechtel et al. 1998, Crowley 2000). Brett Engstrom conducted field reviews in June 2003 within stands proposed for harvest in compartments 33, 34, 41 and 42 (B. Engstrom personal communication, June 2003). Engstrom's survey indicated that stand 42/3 had potential habitat for nodding pogonia (*Triphora trianthophora*), so a field survey was conducted in this stand in August 2003.

The Analysis Area for direct and indirect effects to TEPS/RFSS is the Project Area, including stands proposed for treatment and the connected actions that facilitate treatment (roads, landings, etc.). The Analysis Area for cumulative effects to TEPS/RFSS is the public and private lands within and adjacent to HMUs 213 and 214. The temporal scale is 10 years past and 10 years future.

3.10.2 Biological Evaluation

A Biological Evaluation (BE) for Federally Threatened, Endangered, and Proposed (TEP), and Regional Forester Sensitive Species (RFSS) was completed on July 27, 2003 for all Alternatives proposed for the Peabody Vegetative Management Project in HMUs 213 and 214 (BE, Project Planning Record). The process used and the sources examined to determine potential occurrence of TEP or RFSS presence are listed in the BE.

Based on a pre-field review of all available information, it was the Forest Service Biologist's determination that potential habitat may occur within the Project Area for one Federally Endangered Species (Indiana bat), one Federally Threatened Species (bald eagle), and three Regional Forester Sensitive Species (eastern small-footed myotis, northern bog lemming and American peregrine falcon). The area could provide adequate habitat for Canada lynx, although this species is considered extirpated from the White Mountain National Forest.

The Biological Evaluation was sent to United States Department of Interior Fish and Wildlife Service (USFWS) for review of effects determination and compliance with Indiana Bat Terms and Conditions, and consistency with Canada Lynx Conservation Measures (September 3, 2003, Letter in Project Planning Record).

There is a risk of unintentional damage if Threatened, Endangered, or Sensitive species of plants exist that were not discovered prior to project implementation (FEIS IV-68, USDA Forest Service 1986b.)

The BE details direct and indirect effects to Indiana bat, bald eagle, eastern small-footed myotis, northern bog lemming and American peregrine falcon. The expected adverse or beneficial effects to the Indiana bat were determined to be small and "discountable" (defined as those effects that are extremely unlikely to occur). There is a slight possibility that the Action Alternatives may displace bald eagles temporarily. There may be minimal direct and indirect effects to eastern small-footed myotis foraging and roosting habitat. There is a slight potential for the Action Alternatives to temporarily displace northern bog lemmings, although the potential for presence of this species in the Project Area is low. There would be no direct effects to American peregrine falcon. Indirect effects to peregrine falcon foraging habitat may occur as effects from timber harvesting may diversify available prey base.

Canada Lynx Conservation Assessment and Strategy

The Canada Lynx Conservation Assessment and Strategy describes a process to define suitable, unsuitable, and non-lynx habitat and Lynx Assessment Units (LAU) on federal lands. Conservation measures were described for suitable and unsuitable lynx habitat within an LAU (Ruediger et al. 2000). The application of LAU mapping criteria, factors used to define suitable and unsuitable lynx habitat and application of conservation measures on the White Mountain National Forest are discussed in USFS 2000. All Alternatives are consistent with the conservation measures outlined in the Canada Lynx Conservation Strategy and Assessment (BE, Project Planning Record).

Terms and Conditions from the Biological Opinion for Indiana Bat

The USFWS outlined Terms and Conditions that must be followed to minimize impacts of incidental take of Indiana bats on the White Mountain National Forest (USFWS 2000), as amended in the Forest Plan (USFS 2001). The Terms and Conditions are divided into

those that are applicable throughout the year, and those that are applicable during the non-hibernation season (May 15 through August 30). All Alternatives are consistent with the Terms and Conditions outlined in the Biological Opinion (USFWS 2000), as amended in the Forest Plan (USFS 2001) (BE, Project Planning Record).

3.10.3 Effects Determination and Rationale

Federally Threatened, Endangered and Proposed Species (TEP)

Canada Lynx

All Alternatives will have *no effect* on Canada lynx since this species is considered extirpated from the White Mountain National Forest. Should lynx reoccupy the Forest, consultation with the USFWS is required under Section 7 of the Endangered Species Act.

Rationale

- 1) The lynx is considered extirpated based on surveys conducted over the past two decades for this species.

Indiana Bat

All alternatives *may affect, but would not likely adversely affect* Indiana bat. Since the likelihood of occupancy by Indiana bat is extremely low in the Analysis Area, any effects to Indiana bat from any Action Alternative would be insignificant (cannot meaningfully measure or detect) and therefore discountable (not expected to occur).

Rationale

- 1) Located at the northern edge of the Indiana bat's summer range, the habitat in the Project Area is mature northern hardwoods, mixedwood, and softwood, with canopy closure often exceeding 80%. Indiana bats prefer roosting and foraging canopy closure ranging from 50% to 70%. The likelihood of Indiana bats occurring in the Project Area is very low.
- 2) Forest Plan Standards and Guidelines (USFS 1986a) maintain adequate habitat for Indiana bat by providing direction to maintain a diversity of habitat conditions well distributed across the Forest (III-13), reserve large wildlife trees in areas managed for vegetation, retain standing dead trees where possible (III-15), and maintain riparian habitats (III-18). Implementing the Terms and Conditions outlined for Indiana bat in the Biological Opinion (USFWS 2000), as incorporated in the Forest Plan Amendment (USFS 2001), should also maintain habitat components needed by Indiana bat and minimize the potential for incidental take of an Indiana bat.

Bald Eagle

The No Action Alternative would have *no effect* and all Action Alternatives *may affect*, but would not likely adversely affect the bald eagle.

Rationale

- | |
|---|
| 1) Eagles have been observed near Reflection Pond which is approximately $\frac{3}{4}$ mile from Compartment 42, Stands 1 and 6. Bald eagles usually nest within 0.25 miles of the pond (DeGraaf and Yamasaki 2001). The large supracanopy white pines in these stands may provide roosting habitat but it is unlikely that an eagle would nest in this area since it is too far from the pond. |
| 2) Forest Plan Standards and Guidelines (USFS 1986a) to reserve large wildlife trees in areas managed for vegetation, retain standing dead trees where possible (III-15), and maintain riparian habitats (III-18) should ensure that adequate habitat is maintained for bald eagle. |

Regional Forester Sensitive Species (RFSS)

Eastern Small-Footed Myotis (Bat)

All alternatives *may impact individual eastern small-footed myotis*, but would not likely cause a trend toward federal listing or loss of viability. Alternatives 2 and 3 may provide some beneficial effects by increasing foraging habitat through openings created by clearcut and seed-tree harvests.

Rationale

- | |
|--|
| 1) Most literature indicates that eastern small-footed myotis roost in under rocks on hillsides and open ridges, in cracks and crevices in rocky outcrops and on talus slopes, as well as in buildings (Erdle and Hobson 2001). The likelihood that individual bats are roosting in trees in Project Area is considered low. |
| 2) Forest Plan Standards and Guidelines (USFS 1986a) maintain adequate habitat for eastern small-footed myotis by providing direction to maintain a diversity of habitat conditions well distributed across the Forest (III-13), reserve large wildlife trees in areas managed for vegetation, retain standing dead trees where possible (III-15), and maintain riparian habitats (III-18). Implementing the Terms and Conditions outlined for Indiana bat in the Biological Opinion (USFWS 2000) as incorporated in the Forest Plan amendment (USFS 2001), should also maintain habitat components needed by eastern small-footed myotis. |

Northern Bog Lemming

The No Action Alternative would have *no impact* on northern bog lemming. All Action Alternatives *may impact individual northern bog lemmings, but would not likely cause a trend to federal listing or loss of viability.*

Rationale

- 1) Northern bog lemmings are rare in New England. The likelihood of an individual occurring in the Project Area is considered low.
- 2) Identifiable riparian habitat or wet areas are usually excluded from harvest units minimizing the risk of disturbing an individual animal or associated habitat.
- 3) Forest Plan Standards and Guidelines maintain a diversity of habitats (III, 12-13) and protect riparian habitats (III-19). It is expected these would minimize negative effects and provide adequate habitat for northern bog lemming.

American Peregrine Falcon

All Alternatives *may impact individual peregrine falcons but would not likely cause a trend toward federal listing or loss of viability.* All Action Alternatives may provide some beneficial effects to potential foraging habitat.

Rationale

- 1) Potential cliff sites near the Project Area have been monitored for many years. There are no known active eyries in or near the Project Area.
- 2) Forest Plan Standards and Guidelines (USFS 1986a) provide direction to maintain a diversity of habitat conditions well distributed across the Forest (III-13), should maintain a diversity of habitat and ensure that a suitable prey base is available for falcons should they occupy the cliff sites in the future.

3.11 Heritage Resources

No Issues Related to Heritage Resources

3.11.1 Affected Environment for Heritage Resources

A cultural resource report (CRRR #03-2-03) was completed for the Project Area based on field surveys and a review of historic maps and literature. The full report is available in the Project Planning Record. No pre-European artifacts or improvements were found within the Project Area. Two post-European cultural resource sites were identified within the Rattle River area (stands 42/5 and 42/6).

Within stand 42/5, two cisterns were found within several hundred feet of Route 2. One was recently constructed from concrete tile to replace an older stone and timber cistern. They apparently are or were used as a seasonal water supply for a home across the highway. The newer cistern does not qualify as a cultural resource, but the older stone cistern does. To the east of the cisterns, a stone wall extends up the hillside for several hundred yards. It lies about 15 feet to the east of an old National Forest boundary line.

In stand 42/6 near the edge of an embankment overlooking Rattle River, several small piles of stone were found indicating early pasture clearing efforts. Besides signs of past logging activity, no other cultural activities were found within in the area.

No known Heritage Resource sites lie within or adjacent to the Project Area which are eligible for or are being evaluated for the National Register of Historic Places.

Consultation with local Native American groups and descendants of the Original People has indicated no concerns that any special areas would be disturbed by proposed timber harvest. A careful search of records and local histories has not indicated any unusual activities or camp locations.

The Analysis Area for direct, indirect and cumulative effects to heritage resources is the Project Area. Forest Plan Standards and Guidelines require all earth disturbing activities be designed to avoid, minimize or mitigate adverse effects to heritage resources; and that heritage sites be inventoried, mapped, recorded and protected according to merits beyond the scope of the Analysis Area (potential for the National Register of Historic Places and/or research or interpretive value). Any effects to heritage resources are specific to past, present and potential disturbance to specific sites. An inventoried heritage site within the Analysis Area may have been affected by past actions, but will be avoided in any proposed or future actions.

3.11.2 Direct, Indirect and Cumulative Effects on Heritage Resources

Summary of Direct, Indirect & Cumulative Effects on Heritage Resources

Analysis Area	Time Period	Estimated Acres
Project Area (proposed cutting units)	Present 2003-2013	Alt 1 (0ac), Alt 2 (1,371ac), Alts 3&4 (1,248ac)

Alternative	Summary of Direct, Indirect & Cumulative Effects
1	No effects to heritage resources
2	Known sites will be avoided, Most acres available for summer/fall harvest (663 acres) and most potential acres of ground disturbance (90 acres) means most potential to impact undiscovered sites or artifacts
3	Known sites will be avoided, 102 acres available for summer/fall harvest, potential for 55.7 acres of ground disturbance
4	Known sites will be avoided, 102 acres available for summer/fall harvest, potential for 38.8 acres of ground disturbance

Alternative 1: No Action Alternative

This alternative would not have any effects on heritage resources.

Action Alternatives 2-4

All known sites within the Project Area would be avoided during layout, marking and harvesting operations in all Action Alternatives. There are possible indirect effects on undiscovered artifacts caused by summer and fall harvesting operations. These could include destruction of artifacts and degradation of human-made alterations such as former logging campsites. Alternative 2 proposes the most acres of summer/fall harvest (663 acres) and has the potential for the most disturbance (90 acres, see Table 20) associated with logging and road work. Alternative 3 proposes 102 acres of summer/fall harvest, and has the potential for 55.7 acres of disturbance. Alternative 4 also proposes 102 acres of summer/fall harvest, and has the potential for 38.8 acres of disturbance (because of fewer clearcuts and seed tree cuts). Mitigation measures (Appendix D) are designed to eliminate or lessen any impacts to undiscovered artifacts caused by timber harvesting, road restoration or temporary road construction (Alternative 3 and 4 only).

No vegetative management activities are anticipated in the Project Area for the next 10 years. There is potential for development of a mountain biking trail on existing travel ways, relocation of an existing hiking trail, and construction of a trailhead parking area on National Forest land within or adjacent to the Project Area. A cultural resource survey will be conducted on affected areas prior to any proposed ground disturbing activities.

3.12 Socio-Economics

No Issues Related to Socio-Economics

3.12.1. Affected Environment for Socio-Economics

The northern New Hampshire economy relies on the forest products industry and tourist trade. Forest products jobs are among the highest-paying jobs in the area. There is one pulp mill and two paper mills located within 25 miles of the Project Area. There are also several sawmills and forest product-based manufacturers within close proximity. These businesses purchase timber from a variety of sources, including commercial timber lands, private lands, state and town forests, and the White Mountain National Forest.

There is a steady demand for timber products sold by the National Forest, as reflected by bids on timber sales. Typically, average bid prices on National Forest timber equal or exceed those received on private land. This is especially true for sawtimber.

The proposed sale units are located primarily within the Towns of Gorham (32%) and Shelburne (20%), and the unincorporated Town of Martin's Location (48%), all within Coos County. The main travel arteries providing access to the Project Area are State Route 16, U.S. Highway 2 and the Pinkham B road. These roads have been used for hauling timber in the past, and their continued use for this purpose would not represent a change in expectations for people who regularly travel these roads

There are numerous costs with implementing a vegetative management project on the National Forest. One significant cost is for Analysis: planning the project and analyzing alternatives and potential environmental effects. This includes: 1) surveys (silvicultural, biological, soil, hydrological and cultural resource); 2) supporting analysis (roads, visual objectives and field data); 3) literature reviews; 4) public involvement; 5) interdisciplinary team planning meetings; 6) project layout; 7) development of stand prescriptions and; 8) preparation of environmental assessment and decision documents.

Another significant cost is incurred with project implementation, including timber sale preparation (boundary marking, marking trees for cutting, contract preparation and appraisal, and advertisement) and timber sale administration (laying out skid trails, contract administration, site inspections, accounting, and supervising road work).

While one purpose for harvesting timber in the Peabody Project Area would be to provide high quality sawtimber, the National Forest Management Act provides the direction that a harvesting system should not be selected because it will give the greatest dollar return or the greatest unit output of timber. Communities within which National Forest timber is harvested are reimbursed for the value of that timber through two separate funds.

- The State of New Hampshire has a tax on the value of timber harvested that is paid by the timber purchaser to the towns in which the timber is harvested. This tax averages about 10% of the value harvested, although it is actually based on the species cut. If the timber is harvested in an unincorporated town, the timber tax is paid to the county. In the case of the Peabody project, the Towns of Gorham and Shelburne would receive timber tax directly, while Coos County would receive tax returns for timber harvested in unincorporated towns in the Project Area.
- The Twenty-Five Percent Fund Act of 1908, as amended, directed that 25% of all monies received from a National Forest during any fiscal year should be reimbursed to the state in which the National Forest is located, to be used "for the benefit of public schools and public roads of the county or counties in which such National Forest is situated." For the Peabody project, 25% of gross timber receipts would be returned to Coos County.

Table 24 lists the four most recent timber sales on the White Mountain National Forest. The average revenue generated by these sales is based on timber value minus road costs (which are built into the bid). The average price of \$161 per thousand board feet harvested is used to estimate the gross receipts for the Peabody project alternatives.

Table 24. Gross Revenue Generated from Timber Sales on the White Mountain National Forest for FY 2002 and 2003.

Timber Sale Name	FY Sold	Total Value	Total Volume (mbf)	Price/mbf
Bickford	2002	\$389,218	2100	\$185.34
Iron Maple	2002	\$153,684	1200	\$128.07
Higgins Brook	2003	\$217,711	1611	\$135.14
Fogg Brook	2003	\$321,290	1631	\$196.99

The Analysis Area for direct and indirect effects to socio-economics is the Project Area (the units in which timber harvest is proposed). **The Analysis Area for cumulative effects to socio-economics** is the MA 2.1 and 3.1 National Forest lands and the private lands in and adjacent to HMUs 213 and 214 (lands on which timber harvest is both a short-term and long-term option). Cumulative effects analysis will consider socio-economic activities past (1993-2003), present, and future (2003-2013).

3.12.2 Direct and Indirect Effects on Socio-Economics

Summary of Direct & Indirect Effects on Socio-Economics

Analysis Area	Time Period	Estimated Acres
Project Area (proposed cutting units)	Present	Alt 1 (0ac), Alt 2 (1,371ac), Alts 3&4 (1,243ac)

Alternative	Summary of Direct & Indirect Effects
1	No timber tax receipts or 25% fund revenue to local communities, Does not provide quality hardwood sawtimber to support community stability
2	Generates \$856,200 in gross receipts, with estimated returns of \$592,580 to the U.S. Treasury, and \$299,730 in timber tax receipts and 25% fund payments to Towns of Gorham & Shelburne, and Coos County
3	Generates \$736,575 in gross receipts, with estimated returns of \$502,995 to the U.S. Treasury, and \$257,744 in timber tax receipts and 25% fund payments to Towns of Gorham & Shelburne, and Coos County
4	Generates \$598,115 in gross receipts, with estimated returns of \$386,615 to the U.S. Treasury, and \$209,328 in timber tax receipts and 25% fund payments to Towns of Gorham & Shelburne, and Coos County

Alternative 1: No Action Alternative

Since Alternative 1 harvests no timber, local governments in the Towns of Gorham and Shelburne and Coos County would not generate revenue from timber tax receipts, the 25% fund, or through indirect economic activity associated with a logging operation. This alternative would not meet the Forest Plan Forest-wide goal of “assuring a stable,

reliable source” of high quality hardwoods as a “raw material to support community stability” (Forest Plan, III-3). The cost of Analysis (project planning and environmental analysis) for this project would be \$55,800, the average cost of Analysis for a project on the Androscoggin Ranger District of the White Mountain National Forest (Table 25).

Table 25. Economic Characteristics by Alternative

Measure	Alt 1	Alt 2	Alt 3	Alt 4
Harvest Volume (mbf)	0	5320	4575	3715
Stumpage Receipts	\$0	\$856,520	\$736,575	\$598,115
Total Costs	\$55,800	\$263,940	\$233,580	\$211,500
• Analysis	\$55,800	\$ 55,800	\$ 55,800	\$ 55,800
• Sale Preparation	\$0	\$101,080	\$ 86,925	\$ 70,585
• Sale Administration	\$0	\$ 47,880	\$ 41,175	\$ 33,435
• Road Restoration	\$0	\$ 59,180	\$ 49,680	\$ 51,680
Net Value of Receipts	(\$55,800)	\$592,580	\$502,995	\$386,615
Unit Cost \$/mbf	\$0	\$ 38.49	\$ 39.94	\$ 43.02
10% Yield Tax Receipts	\$0	\$ 85,600	\$ 73,600	\$ 59,800
25% Fund Payments	\$0	\$214,130	\$184,144	\$149,528
NOTES: <ul style="list-style-type: none"> • Stumpage Receipts = Gross Receipts – Road Costs • Unit Cost = Stumpage Receipts / Harvest Volume • 10% Yield Tax Receipts go to Towns of Gorham & Shelburne, Coos County • 25% Fund Payments go to Coos County for schools and roads 				

Action Alternatives 2-4

Each of the Action Alternatives would harvest timber, generating revenue for local governments in the Towns of Gorham and Shelburne and Coos County from timber tax receipts, the 25% fund, and through indirect economic activity associated with a logging operation. The Action Alternatives would meet the Forest Plan Forest-wide goal of “assuring a stable, reliable source” of high quality hardwoods as a “raw material to support community stability” (Forest Plan, III-3). The cost of Analysis for this project would be the same for the Action Alternatives as it was for Alternative 1 (\$55,800).

For each of the Alternatives, Table 25 provides a breakdown of estimated gross timber receipts (based on proposed harvest volume and an average bid price of \$161/mbf), costs to the Forest Service for preparing and administering the proposed harvest, net receipts, unit cost per thousand board feet harvested, and estimated return to local communities through the NH timber tax and the 25% fund.

Alternative 2 harvests the most timber, and generates the most in stumpage and net receipts. It has the lowest unit costs, and the highest return to local communities through the timber tax and the 25% fund. Alternative 4 harvests the least timber, and generates

the least in stumpage and net receipts. It has the highest unit costs, and the lowest return to local communities through the timber tax and the 25% fund.

3.12.3 Cumulative Effects on Socio-Economics

Summary of Cumulative Effects on Socio-Economics		
Analysis Area	Time Period	Estimated Acres
National Forest lands designated as MA 2.1 and 3.1 and private lands within and adjacent to HMUs 213 and 214	1993-2003 Present 2003-2013	Approximately 12,029 acres, including 10,154 NF acres and 1,875 acres of private lands
Alternative	Summary of Cumulative Effects	
1	No timber harvest or revenue generated, Does not preclude future timber harvest	
2	Maximizes revenue now by proposing most acres of even-aged harvest (149 acres)	
3	Less revenue now than Alternative 2 by not harvesting 123 acres, and by reducing even-aged harvest to 116 acres; defers revenue on these acres to future	
4	Less revenue now than Alternative 3 by reducing even-aged harvest to 63 acres; defers revenue on these acres to future	

Revenue generated from the timber harvest between 1993 and 2003 on 428 NF acres of NF lands and 170 acres of private lands are no longer an economic factor. Treatments that emphasized improvement to the quality of hardwood sawtimber in the harvested stands (including individual tree selection on 178 acres of NF lands, and some portion of the private lands) will be an economic factor in the future, but not within the next 10 years. Timber harvest associated with the Stony Brook residential development is having an economic impact now, by generating timber tax revenue for the Town of Gorham; but it is also removing up to 518 acres from the timber land base that could have provided hardwood sawtimber in the future.

Alternative 1 does not harvest timber, but it does not preclude the harvest of timber in the future. It does not allow for future timber harvest on the 295 acres of undesignated lands in HMU 214, since it does not assign these acres to a MA that permits timber harvest. Each of the Action Alternatives would generate revenue for local communities. Alternative 2 maximizes present net worth of the harvested stands by proposing the most acres of regeneration harvest. Alternative 4 proposes the most acres of uneven-aged harvest, deferring the harvest of residual hardwood sawtimber to some time in the future and reducing revenue generated now. All of the Action Alternatives would provide a continued source of quality hardwood sawtimber and other forest products on a sustained basis; and they would support continued employment in harvesting, manufacturing, transportation, and associated forest products industries. Experience has indicated there is and would continue to be demand for timber products locally and nationally. The Forest Service does not anticipate any additional timber harvest in HMUs 213 or 214 over the next 10 years; and the largest private forest land manager (Wagner Forest Products) has indicated they won't harvest timber on their lands for the next 5-6 years.



Figure 3. Paper birch stand. An example of an early-successional species that has gone through the regeneration phase of development and is now a young stand. Even-aged timber harvest can effectively regenerate stands of paper birch, aspen and some northern hardwood species, keeping them as a component of the vegetative landscape and maintaining the species and age diversity that is important to many wildlife species. Sections 1.1.1 (Forest Plan) and 3.9.1 (Wildlife Habitat) of the EA discuss the role of early-successional habitat in wildlife management on the White Mountain National Forest.

CHAPTER FOUR PREPARATION & CONSULTATION

4.1 ID Team Members and Forest Service Contacts

The following individuals participated in development and analysis of the proposed action and all other alternatives as well as subsequent preparation of the environmental assessment.

Interdisciplinary Team:

Lesley Rowse	Wildlife Biologist
Wayne Millen	Assistant Ranger - Forester
Gail Wigler	Forester
Don Muise	Assistant Ranger - Recreation

Forest Service Personnel consulted for professional and technical assistance:

Steve Fay	Soil Scientist
Karl Roenke	Forest Archeologist
Craig Young	Forestry Technician & Timber Sale Administrator
Robert Mengel	GIS Coordinator
Joe Gill	Heritage Resource Paraprofessional
Pat Nasta	Public Affaires and NEPA Specialist
Jay Milot	Biological Science Technician
Tracy Weddle	Hydrologist
John Jakubos	Engineer Technician
Rob Fallon	Forest NEPA Coordinator

4.2 Other Agencies and Individuals Contacted

Other agencies and organizations consulted for professional and technical assistance:

Brett Engstrom	Botanist, Private Contractor
Will Staats	New Hampshire Fish & Game Department



Figure 4. Pine Mountain viewpoint. Androscoggin District forester Wayne Millen describes the proposed Peabody Project Area to members of the public at the viewpoint on Pine Mountain. Wayne is using a printout from a visual management computer program (called Visuals F/X) that superimposes potential forest openings on the landscape as they would be seen from particular viewpoints. In this case, Wayne and the members of the public are examining potential visual effects of openings from timber harvest looking to the south and east from the ledges on Pine Mountain. Section 3.4 of the EA looks at potential effects of the proposed project on visual quality.

PEABODY VEGETATION MANAGEMENT PROJECT

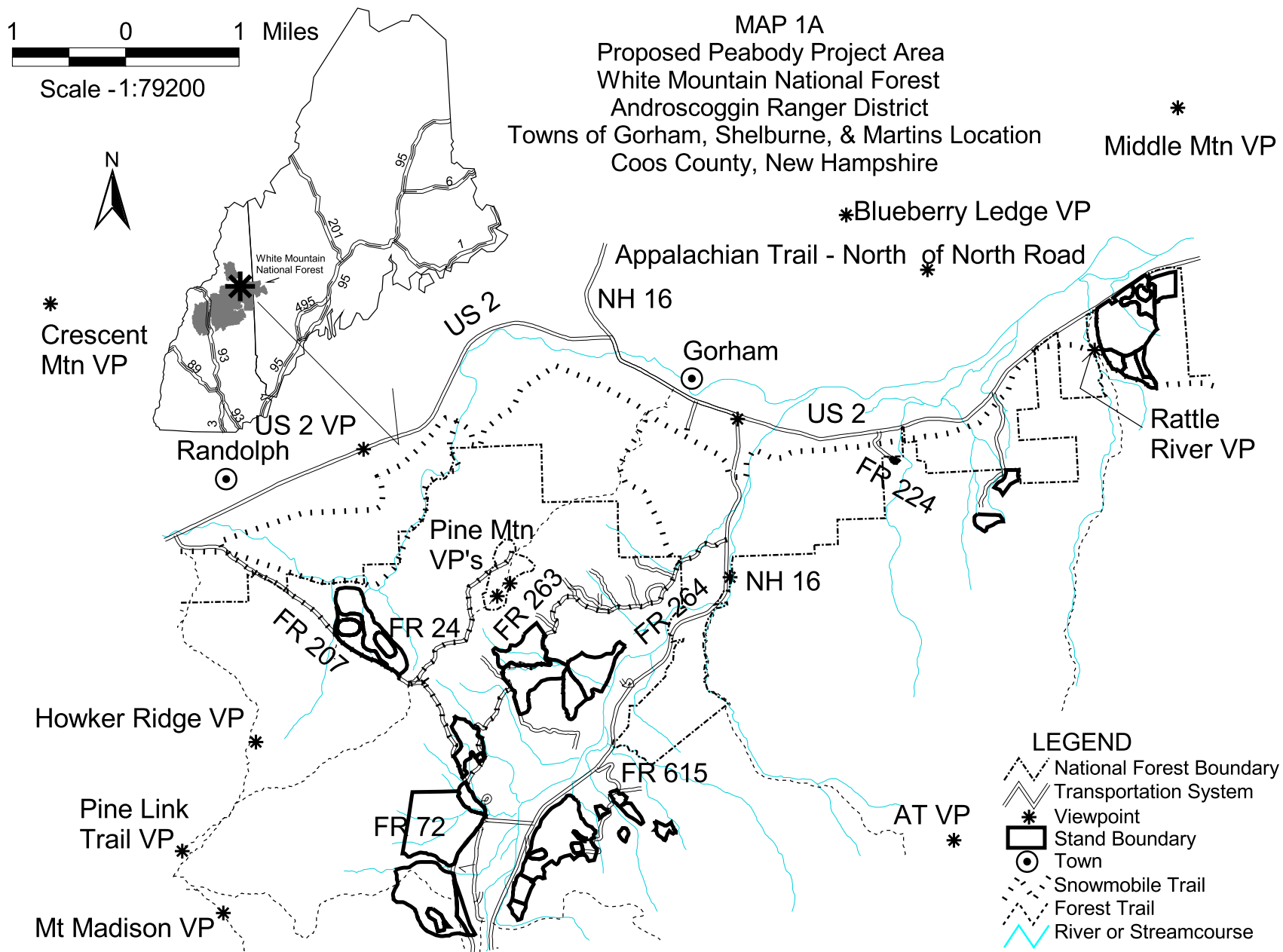
Environmental Assessment

APPENDICES

- Appendix A: Project Maps**
- Appendix B: Species with Potential Viability Concerns**
- Appendix C: Scoping Comments**
- Appendix D: Mitigation Measures**
- Appendix E: Literature Cited**
- Appendix F: Glossary**

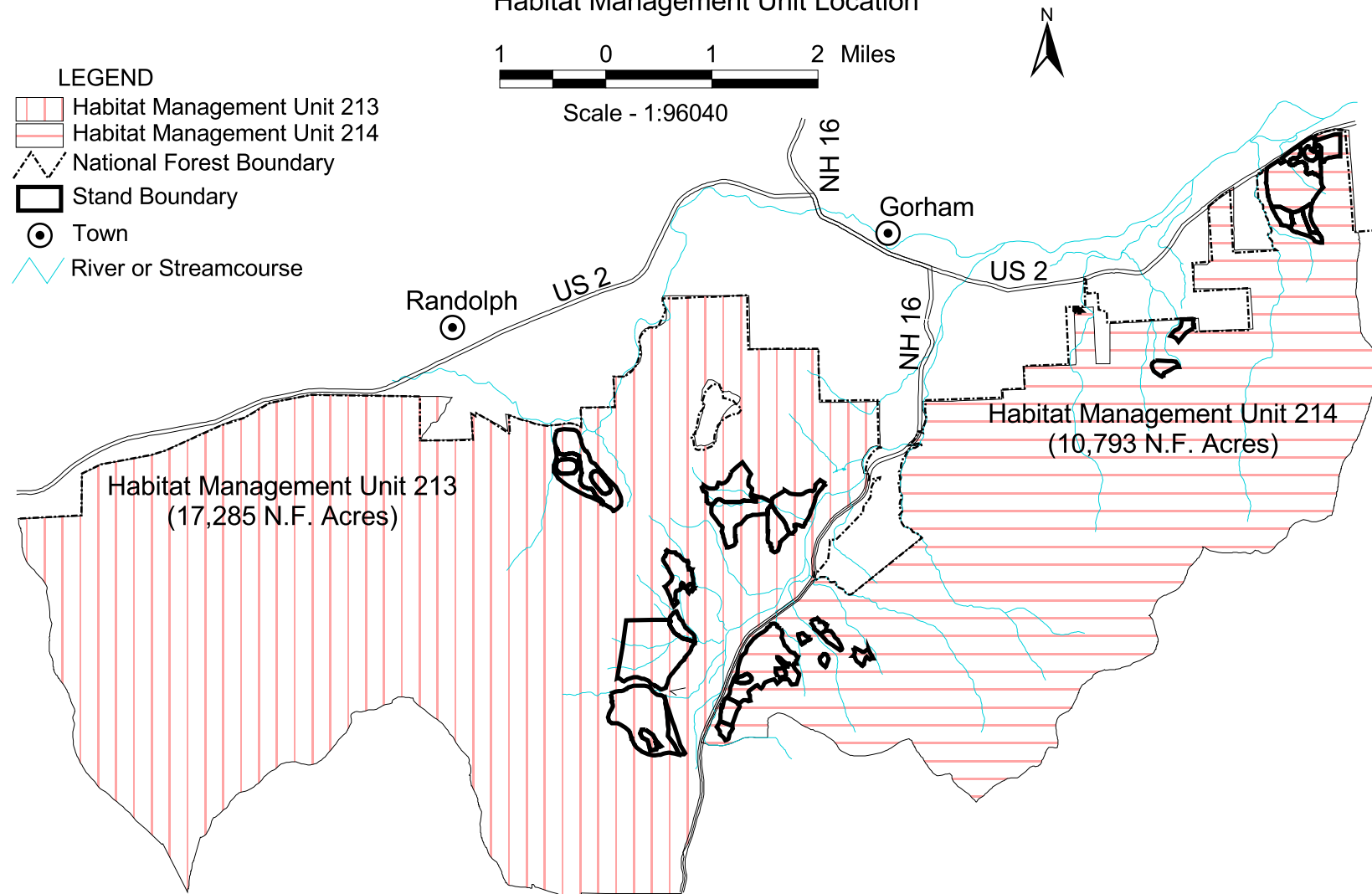


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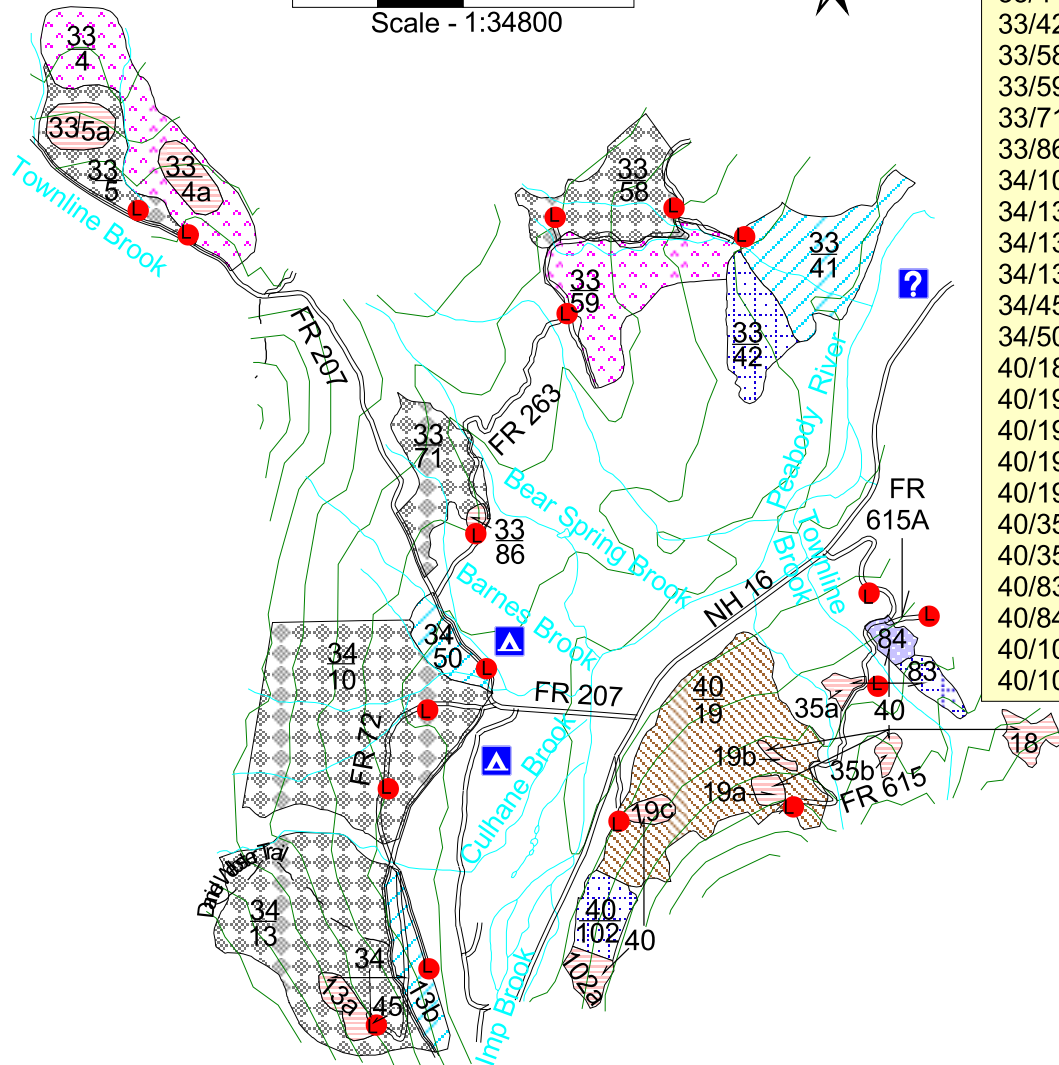
Map 1B
Proposed Peabody Project Area
Habitat Management Unit Location



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MAP 2A
Alternative 2 (Original Proposed Action)
Proposed Peabody Project Area

0.5 0 0.5 Miles
Scale - 1:34800

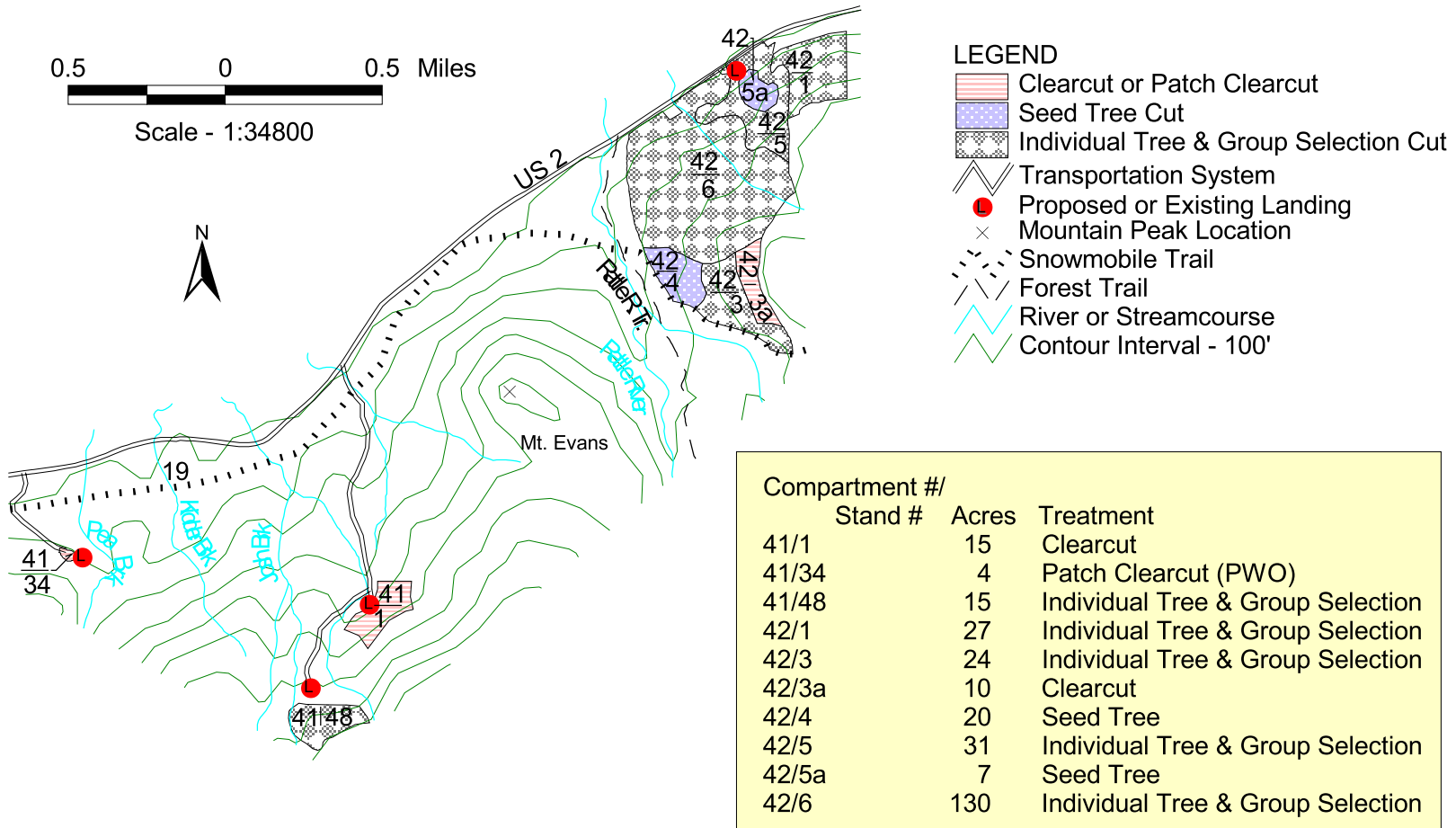


Compartment #/ Stand #	Acres	Treatment
33/4	85	Commercial Improvement
33/4a	15	Clearcut
33/5	38	Individual Tree & Group Selection
33/5a	15	Clearcut
33/41	72(12)	Group Selection
33/42	35	Individual Tree Selection
33/58	63	Individual Tree & Group Selection
33/59	78	Commercial Improvement
33/71	48	Individual Tree & Group Selection
33/86	3	Patch Clearcut (PWO)
34/10	200	Individual Tree & Group Selection
34/13	154	Individual Tree & Group Selection
34/13a	10	Clearcut
34/13b	27(8)	Group Selection
34/45	3	Patch Clearcut (PWO)
34/50	10(2)	Group Selection
40/18	10	Clearcut
40/19	154	Commercial Thinning
40/19a	5	Patch Clearcut
40/19b	2	Patch Clearcut
40/19c	5	Patch Clearcut
40/35a	4	Patch Clearcut
40/35b	4	Patch Clearcut
40/83	10	Individual Tree Selection
40/84	7	Seed Tree
40/102	21	Individual Tree Selection
40/102a	10	Clearcut

LEGEND	
	Clearcut or Patch Clearcut
	Seed Tree Cut
	Individual Tree Selection Cut
	Group Selection Cut
	Individual Tree & Group Selection
	Commercial Improvement Cut
	Commercial Thinning
	Public Information Center
	Public Campground
	Transportation System
	Existing or Proposed Landing
	Forest Trail
	River or Streamcourse
	Contour Interval - 100'

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MAP 2B
Alternative 2 (Original Proposed Action)
Proposed Peabody Project Area



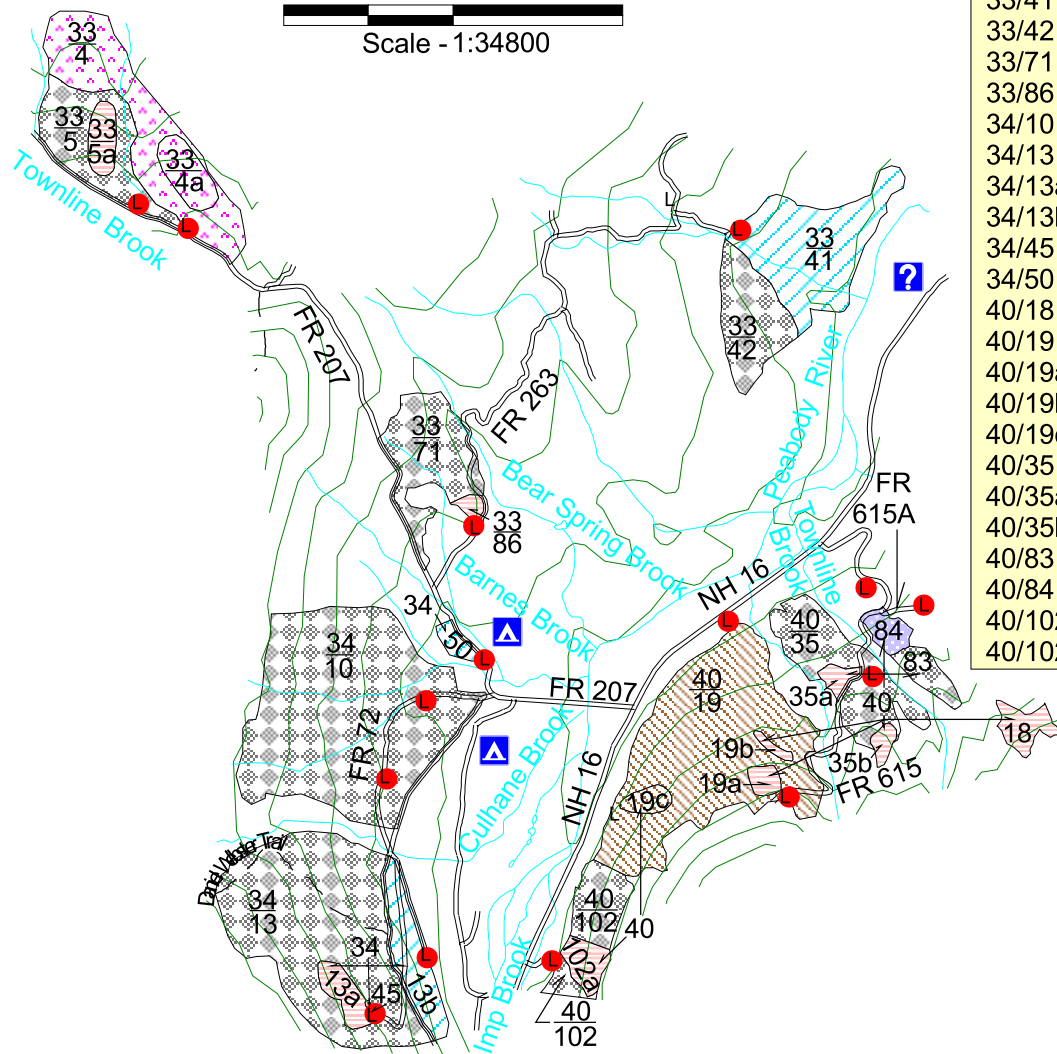
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MAP 3A
Alternative 3 (Modified Proposed Action)
Proposed Peabody Project Area

0.5 0 0.5 Miles

Scale - 1:34800

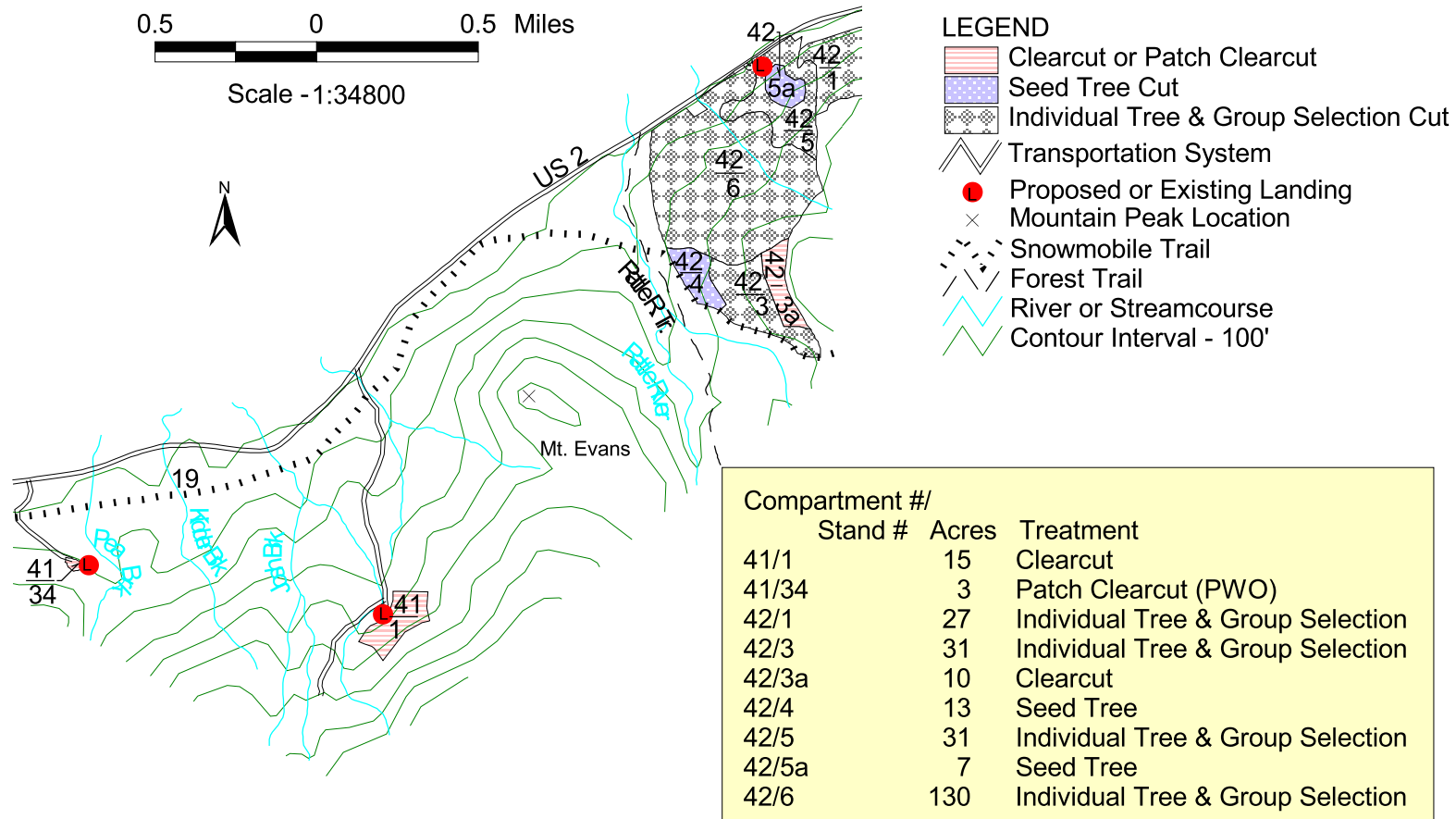


Compartment #/ Stand #	Acres	Treatment
33/4	70	Commercial Improvement
33/4a	15	Commercial Improvement
33/5	43	Individual Tree & Group Selection
33/5a	10	Clearcut
33/41	72(12)	Group Selection
33/42	35	Individual Tree & Group Selection
33/71	45	Individual Tree & Group Selection
33/86	3	Patch Clearcut (PWO)
34/10	200	Individual Tree & Group Selection
34/13	154	Individual Tree & Group Selection
34/13a	10	Clearcut
34/13b	27(8)	Group Selection
34/45	3	Patch Clearcut (PW0)
34/50	5(1)	Group Selection
40/18	10	Clearcut
40/19	154	Commercial Thinning
40/19a	5	Patch Clearcut
40/19b	2	Patch Clearcut
40/19c	5	Commercial Thinning
40/35	49	Individual Tree & Group Selection
40/35a	4	Patch Clearcut
40/35b	4	Patch Clearcut
40/83	10	Individual Tree & Group Selection
40/84	7	Seed Tree
40/102	29	Individual Tree & Group Selection
40/102a	10	Clearcut

LEGEND

- Clearcut or Patch Clearcut
- Seed Tree Cut
- Group Selection Cut
- Individual Tree & Group Selection Cut
- Commercial Improvement Cut
- Commercial Thinning
- Transportation System
- Public Information Center
- Public Campground
- Existing or Proposed Landing
- Forest Trail
- River or Streamcourse
- Contour Interval - 100'

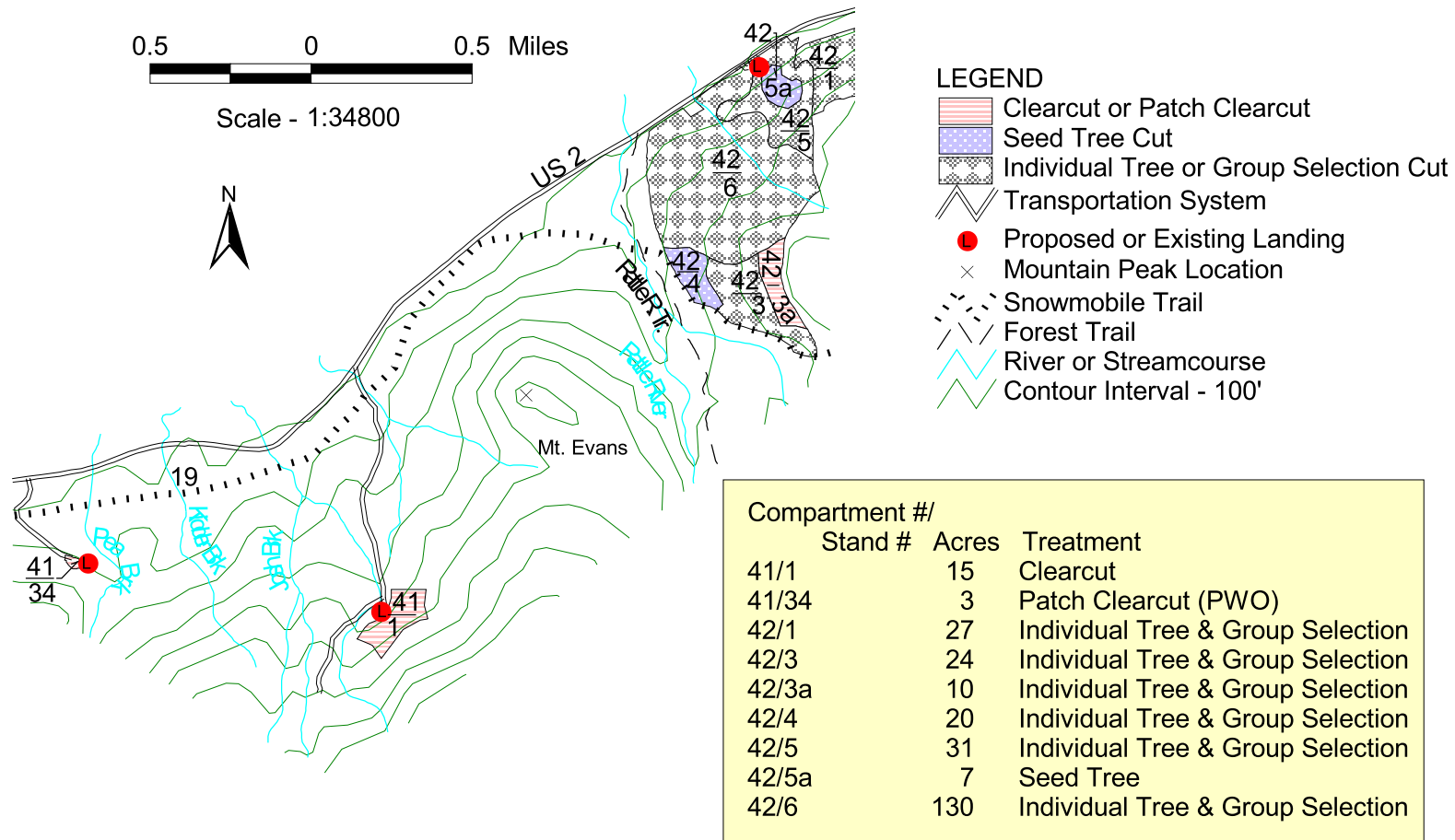
MAP 3B
Alternative 3 (Modified Proposed Action)
Proposed Peabody Project Area



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MAP 4B
Alternative 4 (Reduced 'Even-Aged' Management)
Proposed Peabody Project Area



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APPENDIX B – Species with Potential Viability Concerns

The Forest Plan Revision process for the White Mountain National Forest included an inventory of “Species with Viability Concerns” on the National Forest that are not already listed on the Regional Forester’s Sensitive Species (RFSS) list (See Biological Evaluation in Project Planning Record, and Section 3.10 of the EA, for information on RFSS). Effects analysis for Species with Viability Concerns is included in Section 3.9.2 of the EA. The Project Area is the portion of the Analysis Area that includes stands proposed for vegetative management as well as the area associated with connected actions (roads and landings). For each species of concern, this table notes the following:

- Have there been current or historical sightings of the species of concern within the Project Area?
- Is there suitable habitat for the species of concern within the Project Area?
- Have there been surveys conducted within the Project Area for the species of concern?
- Will the proposed project impact the species of concern or its habitat?

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
AMPHIBIANS						
Jefferson Salamander <i>Ambystoma jeffersonianum</i>	Mixed wetland and forested habitat. Vernal to semi-permanent pools are preferred breeding areas. Surrounding habitat usually mature forest with rocky soils, a duff layer, pit and mound topography, large (> 10 cm) logs, and relatively closed canopy. Usually below 1700’ elev. Avoids floodplains.	NO	Vernal pools may occur in areas with hardpan soils.	NO	NO	This species has only been documented on the southern portion of the WMNF.
BIRDS						
Bay-breasted Warbler <i>Dendroica castanea</i>	Primarily mature coniferous forests (though mixed forests used) up to 4000’. Prefers the thick lower vegetation at edges of small forest openings.	NO	YES	NO	YES	Mature spruce/fir and mixedwood in Project Area.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Rusty Blackbird <i>Euphagus carolinus</i>	Prefers northern ponds, wetlands, beaver ponds typically between 1000' to 4000' in elev. Nests found in spruce and fir.	NO	NO	NO	NO	No ponds in Project Area.
Three-toed Woodpecker <i>Picoides tridactylus</i>	Year-round resident of spruce/fir zone, which typically occurs above 2500'. Breeds in mature coniferous forest with clumps of snags, including at least some 10-12" in diameter. May prefer flooded or swampy areas.	NO	NO	NO	NO	Project Area below 2500'
Pied-billed Grebe <i>Podilymbus podiceps</i>	Waterbodies usually ≥ 12 acres with both open water and emergent vegetation.	NO	NO	NO	NO	No large water bodies in Project Area
FISH						
Atlantic salmon <i>Salmo salar</i>	Larger streams of the Merrimack and Connecticut River watersheds. Also Saco River watershed below Hiram Falls.	NO	NO	NO	NO	Androscoggin watershed on WMNF not historical salmon habitat. No Atlantic salmon are being stocked in larger rivers adjacent to Project Area..
INSECTS						
Boulder Beach Tiger Beetle <i>Cicindela ancocisconensis</i>	Open sand or mix of sand and cobble along permanent streams of mid-sized rivers; feed and live on the sandy areas exposed by receding rivers; common in Saco River basin downstream of WMNF.	NO	NO	NO	NO	Project Area is not in Saco River watershed.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Black lordithon rove beetle <i>Lordithon niger</i>	Old growth northern hardwood or mixed coniferous forest below 2500'. Presently known from The Bowl RNA.	NO	NO	NO	NO	No old growth in Project Area.
A big-headed fly <i>Nephrocerus slossonae</i>	Old growth northern hardwood or mixed coniferous forest above 1500'. Non-aquatic. Presently known from The Bowl RNA.	NO	NO	NO	NO	No old growth in Project Area
MAMMALS						
American Marten <i>Martes americana</i>	Inhabits coniferous, mixed, and deciduous forest that is 30+' tall with at least 80 ft ² of basal area. Prefers structural complexity in stands, including large hollow trees or downed logs.	SUSPECT	YES	NO	YES	Most of Project Area has forest 30+ ft. tall with basal area > 80 ft ² .
ODONATES						
Southern Pygmy Clubtail <i>Lanthus vernalis</i>	Lives in small, shady spring-fed creeks, preferring clean sandy or mud substrates and shallow water.	NO	NO	NO	NO	No streams with sandy or mud substrates in Project Area.
Forcipate emerald <i>Somatochlora forcipata</i>	Found in spring-fed streamlets trickling through subalpine hillside fens with floating vegetation or in pools associated with flowing groundwater in fen areas. Avoid open, sunny fen areas. Eggs deposited in mud-bottomed streamlet pools.	NO	NO	NO	NO	Project Area is not subalpine.
Ebony boghunter <i>Williamsonia fletcheri</i>	Found in low elevation sphagnum bogs adjacent to coniferous or mixed coniferous/deciduous forested areas. Absent from most bogs without sphagnum. Larvae may develop in shallow pools (6" to 12") in sedge fens or among sphagnum mats with open pools and not choked with heaths. It appears to utilize openings within the forest rather than completely open upland habitat.	NO	NO	NO	NO	No sphagnum bogs in Project Area.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
PLANTS#						
Missouri rock- cress <i>Arabis missouriensis</i>	Semi-open conditions of richer sites in the WMNF. Typically south or west-facing slopes below 1500'. Associated spp include red oak, ash, basswood, sugar maple.	NO	SUSPECT	YES	NO	Some patches of enrichment may occur in area but surveys did not document this species.
Pickering's Reed Bent- grass <i>Calamagrostis pickeringii</i>	Acid peats or sands, gravels and shores. Uses a variety of habitats including bogs, wet shores ditches, and dry streambeds, especially in the mountains. Sunny, gravel areas of rivers close to the high water mark. Known from Swift River and Annis Field.	NO	SUSPECT	YES	NO	Some streams and ditches occur in Project Area but surveys did not document this species.
Cut-leaved Toothwort <i>Cardamine concatenata</i>	Rich woods, wooded bottoms, and calcareous rocky banks. (In Maine only known on a beech-maple-oak forested, south-facing hillside).	NO	SUSPECT	YES	NO	Some patches of enrichment may occur in area but surveys did not document this species.
Rocky Mountain Sedge <i>Carex backii</i>	Shady calcareous to neutral, dry-mesic, rocky oak-hardwood and limestone hardwood habitat.	NO	SUSPECT	YES	NO	Oak intermixed with hardwoods in Compartment 42 but surveys did not document this species.
Hair-like Sedge <i>Carex capillaris</i>	Calcareous snowbank communities, wet rocks in alpine, and wetter areas of dry-mesic heath alpine habitats.	NO	NO	N/A	NO	No alpine habitat in Project Area.
Head-like Sedge <i>Carex capitata ssp. arctogena</i>	Dry or wet acidic rocky or gravelly soil in the alpine.	NO	NO	N/A	NO	No alpine habitat in Project Area.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Scirpus-like Sedge <i>Carex scirpoidea</i>	Strongly associated with rocky summits, outcrops, and cliffs. In NH, only known from open ledges and subalpine habitats (Mt. Washington, Mt. Webster and Harts Location).	NO	NO	N/A	NO	No cliffs, rocky summits, or subalpine habitat in Project Area.
Pale Painted-cup <i>Castilleja septentrionalis</i>	Cool, wet ravines, along alpine brooks, and in wet alpine and subalpine meadows. Soil conditions vary by location from moist organic soil to gravelly soil to calcareous cliffs. Good representative of the snowbank/wet meadow/streamside ravine alpine communities.	NO	NO	N/A	NO	No alpine habitat in Project Area.
Northern Wild Comfrey <i>Cynoglossum virginianum</i> var. <i>boreale</i>	Can occur in enriched northern hardwood or mesic red oak northern hardwood, as well as transition limestone hardwood forests. It is mainly in rich mesic woods on sandy or rocky soil where light is available to the understory. Favors southern and western aspects. May also occur on ledges.	NO	SUSPECT	YES	NO	Some patches of enrichment may occur in area but surveys did not document this species.
Yellow Lady's Slipper <i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Rich deciduous woods and swamps, often along the edges of spring run-off streams.	NO	SUSPECT	YES	NO	Some patches of enrichment may occur in area but surveys did not document this species.
Boreal bedstraw <i>Galium kamtschaticum</i>	Prefers somewhat rich seep habitats with non-channelized flowing surface water; found in cool, wet hardwood, mixed, or conifer woods, swamps, and streambanks	NO	SUSPECT	YES	NO	Some patches of enrichment may occur in area but surveys did not document this species.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Moss Bell-heather <i>Harrimanella hypnoides</i>	Snowbank communities, wet seeps, ledges, and crevices in alpine habitats.	NO	NO	N/A	NO	No alpine habitat in Project Area.
Alpine Azalea <i>Loiseleuria procumbens</i>	Exposed dry-mesic heath alpine areas including alpine heath snowbank and the Diapensia-azalea-rosebay dwarf shrubland communities.	NO	NO	N/A	NO	No alpine habitat in Project Area.
Northern Woodrush <i>Luzula confusa</i>	In WMNF, appears to be limited to wet ravine alpine and subalpine communities.	NO	NO	N/A	NO	No wet ravines or subalpine habitat in Project Area.
Smooth Sandwort <i>Minuartia glabra</i>	Species prefers rocky summits and outcrops up to 3000 ft in elevation. When found in forested habitat, it is in openings created by rocky ledges.	NO	NO	N/A	NO	No rocky summits or ledges in Project Area.
Prairie Goldenrod <i>Oligoneuron album</i>	Occurs primarily on dry, calcareous cliffs and ledges. May also occur in open fields and roadsides. All known NH occurrences are on calcareous soil or bedrock.	NO	SUSPECT	YES	NO	No cliffs or ledges in Project Area. Some patches of enrichment may occur in area but surveys did not document this species.
Mountain Sorrel <i>Oxyria digyna</i>	Moist, rocky slopes and ledges; alpine streamsides and ravines; snowbanks and headwalls. Above 3500' in northern New England.	NO	NO	N/A	NO	No alpine habitat in Project Area.
Alpine Timothy <i>Phleum alpinum</i>	In NH, uses wet meadows, wet ravines, and damp shores in the alpine zone.	NO	NO	N/A	NO	No alpine habitat in Project Area.
Jack Pine <i>Pinus banksiana</i>	Rocky summits, rock outcrops and ledges; favors well-drained loamy sands but is more often found on dry, gravelly or sandy sites. In WMNF, occurs from 2200-4000' elevation.	NO	NO	N/A	NO	No rocky summits or ledges in Project Area.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Alpine Meadow Grass <i>Poa pratensis ssp. alpigena</i>	In NH, uses nutrient poor soils in alpine/subalpine dry-mesic heath and meadow communities.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Douglas knotweed <i>Polygonum douglasii</i>	Prefers exposed rocky slopes and hillside ledges in well-drained soil where little other vegetation grows. Can also grow in nutrient-enriched hardwood forests.	NO	NO	YES	NO	No exposed rocky summits or ledges in Project Area. Some patches of enrichment may occur in area but surveys did not document this species.
Viviparous Knotweed <i>Polygonum viviparum</i>	Wet, mossy rocks, cool or damp slopes, gravels, and seeps in alpine and subalpine areas.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Algae-like Pondweed <i>Potamogeton confervoides</i>	Occurs in strongly acidic soft-water bogs, lakes and ponds at a variety of elevations. Also found in slow-flowing acidic streams. Likes muddy shores with lots of vegetation; typically found at depths of less than 15', though water can be deeper. Not known to occur in beaver ponds.	NO	NO	YES	NO	No slow moving streams or ponds in Project Area.
Yellow rattle <i>Rhinanthus minor ssp. groenlandicus</i>	Snowbank, wet ravine, and wet meadows in alpine/subalpine zone.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Lapland Rosebay <i>Rhododendron lapponicum</i>	Strongly associated with dry-mesic heath communities in the alpine. Tolerant of dessication; occurs on well-drained, thin, acidic, gravel-stoney soils. Does not grow on rock outcrops.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Silverleaf Willow <i>Salix argyrocarpa</i>	Moist soils in alpine or subalpine streamside and ravine. Known in Tuck's Ravine, Lakes of the Clouds, Ammo Ravine	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Dwarf Willow <i>Salix herbacea</i>	Snowbank/wet ravine alpine system. In NH, typically occurs in cool, wet ravines, snowbank communities, and along alpine brooks. Grassy, sandy, or rocky places in alpine areas; often on thinner soils than other snowbank/wet ravine species.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Satin Willow <i>Salix pellita</i>	Wetland obligate. Uses river or stream banks, floodplain forest/moist thickets, forested swamps and lake or pond shores.	NO	SUSPECT	YES	NO	Streams occur throughout Project Area but surveys did not document this species.
Three-leaved Black Snake Root <i>Sanicula trifoliata</i>	Limy deciduous woods below 1500'. Most occurrences on steep slopes. Appears to associate w/ dense lush ground cover and relatively closed canopy but has been found near clearcuts and cliffs which may indicate it takes advantage of sunny conditions.	NO	SUSPECT	YES	NO	No steep slopes in Project Area. Some patches of enrichment may occur in area but surveys did not document this species.
Alpine Brook Saxifrage <i>Saxifraga rivularis</i>	Alpine ravines, wet and mossy areas, wet cliffs, and some dry-mesic heath alpine/subalpine communities. May benefit from reduced competition associated with moderate disturbance. May be a nitrophile.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Arizona cinquefoil <i>Sibbaldia procumbens</i>	Snowbank/wet meadow/streamside alpine communities; only occurrence is at bottom of a snowfield in Tuckerman's.	NO	NO	N/A	NO	No alpine habitat in Project Area.

SPECIES WITH POTENTIAL VIABILITY CONCERNS						
Species	Habitat Requirements	Sightings within Project Area?	Suitable Habitat within Project Area?	Surveys within Project Area?	Project Impact Habitat or Species?	Rationale
Rock Goldenrod <i>Solidago calcicola</i>	Moist rich woods, rocky or gravelly thickets, talus and cliffs.	NO	SUSPECT	YES	NO	No cliffs in Project Area. Some patches of enrichment may occur in area but surveys did not document this species.
Alpine Meadow-sweet <i>Spirea septentrionalis</i>	Cool wet ravines and snowbank communities in alpine and subalpine habitats.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.
Ciliated Aster <i>Symphotrichum ciliolatum</i>	Open woods and dry to moist thickets, shores, and clearings; occurs in openings in pine barrens and dry northern hardwood and red spruce-hardwood forest, and likes clearings and roadsides. Prefers scattered small or large openings in the forest canopy, but not necessarily early-successional forest habitat. Uses soils and sometimes rocky sites.	NO	SUSPECT	YES	NO	Small openings and roadsides adjacent to hardwoods and mixedwoods occur in Project Area but surveys did not document this species.
Northeastern bladderwort <i>Utricularia resupinata</i>	Pond, lake and bog shores and margins as well as some wet ditches. Prefers clear, acidic waters with sandy, muddy, or peaty shores. May require low water levels to bloom, and needs a slightly higher than average water temperature.	NO	NO	N/A	NO	No ponds or bogs in Project Area.
Mountain hairgrass <i>Vahlodea atropurpurea</i>	In northern New England, is limited to the alpine/subalpine zone, especially herbaceous snowbanks communities.	NO	NO	N/A	NO	No alpine or subalpine habitat in Project Area.

Several surveys for rare plants have been conducted within or near the Project Area (NHNHI 1992, Sperduto & Engstrom 1993, Engstrom & Sperduto 1994, Sperduto 1995, Nichols & Sperduto 1996, Crowley 2000, Engstrom personal communication 2003). None of these surveys found rare plants in the Project Area.



Figure 5. Example of a maintained Permanent Wildlife Opening. This 5-acre site was maintained with a prescribed fire in 2001. The photo was taken in June 2003. The Description of the Alternatives in Chapter 2 of the EA provides information on Permanent Wildlife Openings proposed in the Peabody Project Area, and Sections 3.2 (Vegetation) and 3.9.1 (Wildlife Habitat) of the EA look at potential effects of openings on plant and wildlife species.

APPENDIX C – List of Scoping Comments and Responses

Each comment received during the February 2003 scoping period was reviewed to identify specific issues and concerns. Each comment is listed with a response of how the comment was addressed and where supporting information can be located in the EA.

We appreciate the time all respondents spent reviewing and commenting on the Peabody Project Scoping Letter. Thank you for your thoughtful comments.

Where possible in the following discussions, the respondent is quoted directly and in the context of their full comments. All correspondence is filed and available for public inspection in the Peabody Project Planning Record located at the Androscoggin Ranger Station in Gorham, NH.

Comments and responses are grouped by category:

1. Support for Proposed Peabody Project
2. Vegetation
3. Soils
4. Recreation
5. Wildlife
6. Forest Plan amendment
7. Roads
8. Visual Quality
9. Socioeconomics
10. Cultural Resources
11. General Comments

Support for Peabody Project

1. **Comment:** “I leave it to your judgment on timber cutting and development.” (Wilma Corrigan)
Response: Comment noted.
2. **Comment:** “The following items are important: timber harvest and wildlife habitat management, Forest Plan Amendment, and the connected actions” (Vincent MacIlvain)
Response: Comment noted.
3. **Comment:** “Sounds reasonable to me to combine the previously scoped proposals” (Iris Baird)
Response: Comment noted.
4. **Comment:** “I continue to be supportive of harvesting timber on a sustainable yield basis.” (Bob Richardson)
Response: We appreciate your continued support of our vegetation management projects.

5. **Comment:** “Every effort should be made to bring the status of the Forest up to Plan levels.” (Bob Richardson)

Response: Comment noted.

6. **Comment:** “There is absolutely no reason why timber harvesting and recreation can’t be combined in a healthy manner.” (Leon Favreau)

Response: We have years of experience harvesting stands in the vicinity of recreational areas and past mitigation measures to minimize disturbance to recreational users has been shown to be effective.

Vegetation:

1. **Comment:** “We would like to see an alternative that uses single tree selection instead of clearcutting. We believe the Purpose and Need would still be met under this new alternative. The Wilderness Society does not endorse the use of clearcutting as a silvicultural practice on the WMNF and would like to see the acres of proposed clearcuts in the Project Area changed to single tree selection to maintain a closed canopy forest in the area..” (The Wilderness Society)

Response: We considered an alternative that would use only uneven-aged management techniques, but it was eliminated from analysis because it did not meet the Purpose and Need for lands within MA 2.1 and 3.1 (Section 2.2.1 of the EA).

2. **Comment:** “Timber contracts should have a clause that requires skidders to pile up some of their brush to provide habitat for rabbits”. (Lewis Parker)

Response: All the clauses within the timber sale contract are authorized by the Washington and Regional office and the district does not have the authority to add new clauses without their approval. Though we can not add a clause to the contract, the Forest Service representative can ask the operator to leave slash piled on the landing during sale administration.

3. **Comment:** “...The most serious lack of diversity is the scarcity of old growth, particularly at lower elevations where the greatest species diversity normally occurs.” As stated in the scoping letter, “Lands outside MA 2.1 and 3.1 provide overmature and old growth habitat, but this does not satisfy the need at lower elevations.” (Pierce Beij)

Response: As stated in the scoping letter, “Lands outside MA 2.1 and 3.1 provide over-mature and old growth habitat, but this does not satisfy the need at lower elevations”. There are approximately 33,000 softwood acres of softwood and 60,000 hardwood-capable acres (based on ELTs) at lower elevations of the National Forest in MAs other than 2.1 and 3.1. While it is unlikely given the history of harvesting in the late 1800s and early 1900s that much of this is “old growth”, the average age is probably 80-years or more, and, ultimately, it will become “old growth”. The Forest Service has been doing inventory to search out other good examples of existing old growth. One of those is the Shingle Pond area, where 250 year-old hardwoods and softwood trees have been documented at an elevation of 1700’.

4. **Comment:** Has past management activities been successful in encouraging softwoods and moving toward meeting our HMU objectives?

Response: Taking actions such as removing overtopping hardwoods to encourage softwoods is moving us toward the objectives. Also, focusing our efforts on uneven-age silviculture on softwood-capable ELTs maintains or increases the softwood composition, and helps avoid an intermediate stage predominated by hardwoods. On many sites, however, especially at low elevations, it will take a long-term investment of time and effort to increase softwood representation because much of this land was heavily harvested, burned, and in some cases, used for agriculture, in the early 1900s.

5. **Comment:** “What are the % of existing stands in the mature age class and the intermediate age classes? This information needs to be detailed not just at the HMU level, but also at the Forest and regional (NFS land and private land) level.” (The Wilderness Society)

Response: The analysis only requires that we evaluate lands within the Project Area. Within HMUs 213 and 214 approximately 91% of the land is classified as mature and overmature, and 6% of the land is classified as young (10-60 years).

6. **Comment:** “Please make sure that the timber sales include a fair amount of good grade timber. I am told that some sales in the recent past were of mainly low grade wood.” (Leon Favreau)

Response: One of the goals of 2.1 and 3.1 lands is to provide high quality sawlogs on a sustained yield basis and we design our timber sales to meet this resource objective and be marketable. Some of our timber sales are quite desirable with a high percentage of sawlogs while others have a lower percentage. On average, approximately 30% of the volume from the sale is quality sawlogs and the remaining volume is pulpwood. It is very rare to have a timber sale not receive bids from area timber businesses. Our recent timber sales were salvage sales that focused on trees that were damaged in the 1998 Ice Storm. Though these trees were injured, researchers have advised us that the sawtimber quality should still be fine. The purchaser of one of these sales has been quite satisfied with the quality.

7. **Comment:** “Please describe the methodology that was used for gathering information from the field. How recently has compartment and stand records been updated and compared to actual conditions on the ground. Stand conditions on the ground form the backbone of any analysis. If the site conditions are not in actuality as they appear in the records, the analysis will be flawed from the beginning.” (The Wilderness Society)

Response: The following steps were used in the selection of proposed harvest units for the Peabody Project:

- 1) Reviewed existing conditions of previously selected stands for the North Carter and Pine Mountain to see if conditions had changed since they were first proposed.
- 2) Queried the GIS database to identify stands within HMU 213 and 214 that met the following criteria: a) the basal area of the stand was greater than 120 for

softwoods and 100 for hardwoods; b) stands had not been silviculturally treated since 1990; c) the terrain was suitable for ground based timber operations; d) the stands were in management areas 2.1 and 3.1 and; e) stands were over 50 years old for hardwoods and 40 years for aspen. The GIS database is primarily composed of stand data collected from 1992 through 2002, although some stands have not been updated since 1985.

- 3) Stands identified in number 2 were field verified for harvest by taking plot data such as species, diameter, basal area/plot, and number of sawlogs/tree, and inputting it into a cruise program to assess volume and basal area for the stand. From this, we selected those stands that would benefit from silvicultural treatment.
- 4) Compartment records were updated with new plot information.
- 5) Once stands were identified, the ID team visited the sites numerous times to evaluate issues relating to wildlife habitat, recreation, streams, soils, fisheries and transportation.

8. **Comment:** “How many years do you expect the harvest will last? What is the average number of sales and payment units for a project of this size? (The Wilderness Society)

Response: Timber sale contracts are usually three to five years and vary depending on the season of operations. Alternative 2 proposes that 48% of the project be harvested in the summer and fall, while Alternatives 3 and 4 propose 8% of the project. Summer/fall harvest shortens the sale completion time since stands can be harvested year round and not just during the winter months. The project would be divided into three timber sales; the North Carter Timber Sale would be composed of thirteen stands on the east side of the Peabody River; the Pine Mountain Timber Sale would be composed of fourteen stands to the west side of the Peabody River and; the Rattle River Timber Sale would be composed of seven stands within the Rattle River watershed and two stands south of Route 2.

9. **Comment:** “Please describe any future proposed timber sales and other actions in the area surrounding the proposed project.” (The Wilderness Society)

Response: We do not anticipate any timber sales within HMU 213 and 214 for the next ten to fifteen years. We may propose treating stands in surrounding HMUs in the future. Other potential future actions within the Project Area include the development of a mountain bike trail system and relocation of the Ledge trail and construction of an accompanying parking lot.

10. **Comment:** “Please compare and contrast the benefits of the project to increase age class and habitat diversity versus leaving the mature and over-mature northern hardwoods, aspen and birch stands. Please define “over-mature”. (The Wilderness Society)

Response: The benefits of increased age class and habitat diversity can be found in Section 3.2 (Vegetation) and Section 3.9 (Wildlife) of the EA. Overmature is defined differently depending on the forest type. For aspen, it is 60+ years of age; paper birch is 80+ years; northern hardwoods is 120+ years; oak-pine is 100+ years; spruce-fir is 90+ years.

Soils:

1. **Comment:** “It can not be reasonably argued that whole tree harvesting does not deplete calcium; the only question is whether the loss is significant. Considering this uncertainty...why not avoid this practice and leave the slash well distributed in the woods?” (Pierce Beij)

Response: Whole-tree harvesting is no longer proposed in the Peabody timber sale. On the matter of depletion, the Northeast Research Station has recently obtained a grant to study calcium-oxalate, a yet unaccounted for potential source of soil calcium, which may shed new light on the ongoing discussion about calcium depletion.

2. **Comment:** “I am concerned about soil compaction problems associated with timber harvesting activities. Two of the ELTs, 115A and 115G, are rated high for skidder compaction... I would like to see some discussion and assessment of compaction effects on soils and forest health and productivity in the EA. Based on personal observation on some sites in WMNF, it appears that soil damage from compaction at or near landings areas is likely to last for 50 years or more.” (Erik Sohlberg)

Response: See Section 3.6.1 (Soil Erosion) of the EA.

3. **Comment:** “Please provide more detail on the soil types in the Project Area and the specific vegetative conditions they support.” (The Wilderness Society)

Response: The WMNF uses ecological land type (ELT) classification, which includes soils information, to depict vegetative conditions on the National Forest landscape (Section 3.6.1, Soil Erosion). This includes succession trends of changing species proportions and identification of those species that would be predominant in the absence of disturbance, natural or human-caused. This generally corresponds to the forest habitat typing devised by Bill Leak at the Bartlett Experimental Forest, so there is good documentation since the early 1930s on species and soil relationships.

4. **Comment:** “Describe erosion control measures along road improvements” ((The Wilderness Society)

Response: Erosion control measures on existing intermittent roads include re-establishing ditches and drainage structures to avoid concentration of surface water that may lead to stream sedimentation. Stabilization after harvesting may include seeding and mulching at selected locations, but with our well-distributed rainfall, and generally rapid re-invasion of native species, this is often unnecessary to prevent soil erosion, depending on factors such as steepness of slope, irregularity of terrain, and proximity to streams. Erosion control on existing all-season roads includes mainly grading the road surface to facilitate drainage of surface water and maintenance of ditches and culverts to manage surface water in accord with the original design of the road (Appendix D, Mitigation Measures).

Recreation:

1. **Comment:** “We have concerns about increased illegal ATV and snowmobile use in the area as a result of the restoration of existing roads and bridge alterations. Please describe mitigation measures to address this concern?” (The Wilderness Society)

Response: On the White Mountain National Forest, there are no designated summer ATV trails. During the winter, ATV and snowmobile use is permitted on designated trails when adequate snow levels and conditions warrant. All other uses are not permitted. The proposed road and bridge alterations will not change this condition. In addition, after harvest operations are completed, all restored roads will be closed with appropriate closure devices (gates, boulders, earthen berms, etc...) to prohibit further vehicular use except for administrative purposes. The Forest Service works closely with the New Hampshire State Trails Bureau and with local snowmobile clubs to ensure that trail directional signs are in place directing users to approved trails. Occasional illegal ATV and snowmobile use does occur within the Analysis Area, however occurrences are rare. Frequent summer and winter patrols of the Analysis Area by Forest Service officers tend to deter these activities.

2. **Comment:** “Please disclose the potential for increased noise and traffic that would result from increase logging trucks and construction. What mitigation measures would be implemented for the nearby hiking trails which are used year round.” (The Wilderness Society)

Response: Increased noise and traffic will occur as a result of logging activities within the Analysis Area. To mitigate these effects we have proposed that harvest activities around congregated recreational sites (such as Dolly Copp campground) be allowed during the winter season only. Typically, recreational use during the winter season occurs at lower levels than during the spring, summer and fall seasons. Winter hikers will experience the sights and sounds of harvest activities, however weekend and holiday hauling will be prohibited. (Section 3.3, Recreation)

3. **Comment:** How will the installation of new culvert or a new bridge affect the portion of the Hayes Copp ski trail? Would it be rerouted? Would the projected value of the trees be sufficient to warrant the cost of replacing the wooden crossings and Culhane Bridge?” (The Wilderness Society)

Response: Approximately 1.1 miles of the Hayes Copp Cross Country Ski trail that follows the Culhane Brook Road will be closed to use during winter harvest operations. The District proposes to reroute the ski trail during this period to accommodate use of the portions of the ski trail system that are not impacted by the harvest operations.

- The current Culhane Bridge is in disrepair and needs to be replaced. The current bridge was built with native stringers and decked with dimensional lumber. Both the stringers and the decking are failing and pose a hazard to users. To accommodate current and expected future use the District proposes to replace the Culhane Brook Bridge with a permanent bridge that meets Forest Service safety standards. A new bridge would allow timber hauling for this

project and then be utilized for non-motorized recreational activities related to the Hayes Copp ski trail system. The reconstructed bridge will also provide administrative equipment access for trail maintenance and grooming purposes.

- There are 18 timber trail bridges located on the Culhane Brook Road that will be removed and replaced with metal culverts to accommodate log truck hauling. The timber bridges were placed along the ski trail over 10 years ago. Replacing the timber bridges with metal culverts will accommodate the hauling and will be left in place to provide safe crossings for non-motorized recreational uses. In addition, set culverts will reduce maintenance and replacement costs. (Section 3.3, Recreation)

4. **Comment:** “In stand 34/13, how will the Daniel Webster trail be affected by the logging? (Fred Lavigne)

Response: The Daniel Webster trail will receive direct short-term effects from harvest activities proposed in Stand 34/13 (Section 3.3, Recreation). Approximately .6 miles of the trail passes through the harvest unit. Marking instruction will include a 50’ buffer (25’ on either side of the trail) with modified marking instructions to feather marking away from the buffer. Hikers may be affected by harvest activities adjacent to the trail and by equipment skidding logs across the trail. Mitigation measures to reduce safety hazards to hikers during operational period include the following:

- Signs will be posted along the trail informing hikers of harvest activities
- Skid crossings will be limited to minimize contact between hikers and logging equipment and to protect the existing trail tread as much as possible.
- The tread way will be cleared of debris to maintain trail directionality.
- Harvesting will be conducted in winter during periods of low usage.

Wildlife:

1. **Comment:** “My concern is rabbit and snowshoe hare habitat. With new logging practices they have no protection from predators and only limited homes in thickets. With the gradual loss of rabbits over the past 40-50 years we can not continue to call it a cycle. Timber contracts should have a clause that requires skidders to pile up some of their brush to provide habitat for rabbits”. (Lewis Parker)

Response: The key habitat component that snowshoe hare need for cover is a dense understory (Hodges 2000), which can include forested stands with shrubs, densely stocked stands, swamps, bogs, or alder fens. During active harvest operations, all slash that is created from delimbing trees in log landings will be hauled back into the forest. This may provide some limited cover for wildlife in the short term. However, the best cover habitat resulting from this timber sale would be growth of the understory and eventually young saplings in clearcut, patchcut, seed tree cut, and small groups in softwood stands.

2. **Comment:** “What are the % of existing stands in the mature age class and the intermediate age classes? This information needs to be detailed not just at the HMU level, but also at the Forest and regional (NFS land and private land) level.” (The Wilderness Society)

Response: Tables 1 and 2 in the Wildlife Report (Project Planning Record) provide this information for the Analysis Area, which includes HMUs 213 and 214 (see also, Section 3.9.1 of the EA). A table of habitat trend analysis provides this information for the White Mountain National Forest between 1984 and 2003 (Tables in Project Planning Record). The sources of information for the forest-wide habitat trend analysis includes USFS 1993, 1994, and 1996 monitoring reports and queries from the White Mountain National Forest CDS database in 2003. The Analysis Area includes private property adjacent to NF lands in HMUs 213 and 214. Aerial photos as recent as 1995, show owners of adjacent private lands conducting similar management activities as the forest, ranging from clearcuts, commercial thinnings to no harvesting. Looking at the landscape, there are tracts of timber, either that have been commercially thinned or unmanaged, interspersed with small openings of young, even aged trees. Besides vegetation management, other land management activities occurring on private lands within the Analysis Area include residential development on 518 acres in the Stony Brook area.

3. **Comment:** “I am supportive of improving wildlife habitat by creating small clearcut openings to promote browse and protect/improve winter yarding areas.” (Bob Richardson)

Response: Comment noted.

4. **Comment:** Which species will benefit or be negatively harmed from the creation of increased age class and habitat diversity? “What species will be harmed from the loss of late successional habitat? If negative effects are anticipated, what mitigation measures are recommended?” “Will the cumulative total of early successional habitat on non-federal lands negate the need for on-forest early successional habitat creation? What mitigation measures are recommended?” (The Wilderness Society)

Response: The wildlife habitat strategy developed for the White Mountain National Forest was based on research that indicated that a diversity of forest types and age classes is needed to provide for the habitat needs of the full array of wildlife species that inhabit the White Mountain National Forest (DeGraaf and Rudis 1986, DeGraaf et al. 1992). These publications provide information on the type of habitats used by wildlife species that occur on the White Mountain National Forest. Section 3.9.1.3 analyzes the cumulative effects of land management activities on private lands in the Analysis Area. The Forest Service can analyze these activities, but has no jurisdiction to control management on private lands

Management Indicator Species are defined for the various habitats on the Forest, to assess effects of management activities on their populations. An evaluation of these species showed that most were stable or increasing in population levels and habitat. The only exception appears to be with species associated with early-successional habitats (USFS 2000, 2001a).

Mitigation measures are recommended to protect specific habitat features such as dead and down wood or softwood inclusions (see Section 3.9, Wildlife; and Appendix D, Mitigation Measures).

5. **Comment:** “What are the results of your monitoring, evaluation and survey for avian, TES and RFSS species, MIS, goshawks, Indiana bats, Canada Lynx, wildlife and small whorled pogonia in and around the Project Area?” (The Wilderness Society)

Response: Monitoring guidelines for wildlife are defined in the Forest Plan (Forest Plan Chapter IV-12). Monitoring of the various Management Indicator Species occurs at a forest-wide or region-wide level (USFS 2001a). Monitoring efforts for TES and RFSS species in the Project Area are described in the BE (Project Planning Record). The results of monitoring efforts for MIS, TES, and RFSS species on the White Mountain National Forest are described in the annual forest monitoring reports (USFS 1993, 1994, 1995, 1996, 1998, 1999, 2000).

6. **Comment:** “What predators will take advantage of the increased access to the area that the creation of early-successional habitat will provide? What species will be negatively affected by the increase access?” (The Wilderness Society)

Response: Early successional habitat can provide a flush of new growth that supports increased local use by species such as snowshoe hare, mice, some songbirds (e.g. chestnut-sided warbler and mourning warbler) and many insects. "Predators" come in many shapes and sizes. For example, many bat species (including TES species) will forage for insects in openings; raptors will take advantage of openings to capture songbirds and mice; carnivores such as marten, coyote, bobcat, and lynx will hunt along openings for snowshoe hare and mice. All of these species are indigenous members of these communities. As a part of Forest Plan Revision, a Species Viability Evaluation was completed to determine which species might be at risk for loss of viability on the WMNF. No early-successional species are on this list, therefore, predation is not expected to cause negative impacts to any species utilizing early-successional habitats."

Forest Plan Amendment:

1. **Comment:** “It is appropriate to assign a management area designation to the land in HMU 214... that is consistent with the management designation of the surrounding area.” (Bob Richardson)

Response: We agree. It is part of the rationale for assigning these lands to MA 2.1.

2. **Comment:** “... the EA should more fully explain the analysis that has been done to determine whether this land is suitable for MA 2.1 designation. What other management area designations were assessed for this land?” (The Wilderness Society)

Response: During the scoping process, we requested comments from the public on the proposed MA 2.1 designation for lands within the Analysis Area. We did not receive any comments suggesting alternative MA designations to the proposed area.

We conducted numerous surveys in the area and had numerous site visits with ID team specialists (recreation, soil scientist, hydrologist, silviculturist and wildlife biologists) to evaluate the effects on the resources. We concluded that the land is not unique from surrounding areas and there is little justification for managing it differently. The land will continue to be managed for recreation and wildlife, as well as vegetation. The MA 2.1 designation would be consistent with past Forest Plan amendments that assigned this designation to lands with similar characteristics (see Section 2.2.3 for detailed discussion)

Roads:

1. **Comment:** “Please describe the methodology of evaluating existing roads conditions. How will the improvements be funded? Who will do the work? Will improvements result in credit to timber purchasers? What is the cost of reconditioning? Will this increase the road maintenance needs? Will this result in a change in road classification status? How would this affect the % of roads in each class across the forest? Would improvements result in more “roaded” forest? What is the state of roads system analysis on the Forest as a whole?” (The Wilderness Society)

Response: All roads needed for harvesting within the Project Area were inspected on the ground by Forest Service road engineers and resource specialists. Roads were analyzed to evaluate soil stability, past erosion problems, drainage needs and additional engineering work required to bring roads up to Forest Service standards for transport of machinery and logs. There are no new permanent roads associated with this sale; only road restoration, temporary road construction and pre-haul maintenance which will be completed by the purchaser. Costs for road work required for this project will be deducted from the total sale value. Table 25 in Section 3.12.2 lists the road costs associated with each alternative. Once the project is completed, any road improvements will be removed and the roads will be closed to vehicle use. Future maintenance on these roads will be deferred until they are needed again, and their classification will remain unchanged. The Forest Service hopes to complete a road system analysis for the Forest by the early months of 2004.

2. **Comment:** “Please describe the methodology for evaluating whether the wooden crossings and the Culhane Bridge would be replaced with culverts or a new truck bridge. What is the cost?” (The Wilderness Society)

Response: Most of the timber bridges on the Hayes Copp ski trail are slowly deteriorating over time due to extreme weather conditions and require yearly repair. These crossings would be replaced by metal culverts paid for by recreation funds and installed by Forest Service crews. This is a popular cross country ski trail and metal culverts provide a long-term, low maintenance solution to the many stream crossings when compared to timber bridge crossings. A temporary metal bridge would replace the bridge across Culhane Brook and would be removed at the end of the project. This metal bridge was paid for by timber funds and its use is dedicated to timber projects on the National Forest. A new timber bridge would then be constructed across Culhane Brook by Forest Service crews.

3. **Comment:** “Describe the projected effects of an increase in visitor access that improved roads would provide. Describe mitigation measures that would be used to deny access to temporary roads after the project ended.” (The Wilderness Society)

Response: There will be no increase in motorized access to the area as a result of road restoration. This process restores existing roads to their intended service level for this project. All restored roads will be closed, and culverts and bridges would be removed, after completion of use; and the gate at the junction of the Pinkham B road and Hayes Copp ski trail would be replaced. Temporary road improvements would be removed upon completion of the project.

Visual Quality:

1. **Comment:** “Since some of the cuts will be visible....this might be a good opportunity to do some kind of educational or interpretive work---signage. (Iris Baird)

Response: We appreciate your comment and realize it is a good idea to educate the public on benefits of clearcutting for both wildlife habitat and improving forest stand conditions.

2. **Comment:** “How will the FS ensure that the viewsheds from Pine Mt, Presidential Range and the AT would not be affected? (The Wilderness Society)

Response: The viewshed from Pine Mt, Presidential Range and the AT would be affected by the proposed clearcuts (Section 3.4, Visual Quality Objectives). To minimize these effects, we employed a computer program to model the proposed clearcuts on the landscape. This allowed us to improve the design (size and shape) and placement of the proposed clearcuts to minimize visual affect. All of the proposed clearcuts in Alternatives 3 and 4 meet the Visual Quality Objectives listed in the Forest Plan.

Socioeconomics:

1. **Comment:** “While timber from the WMNF is only a small percentage of the wood supply, even a small amount can lower prices when there is a glut in the market. The competition against private landowners makes it more difficult for them to do good management.” (Pierce Beij)

Response: The comment seems to be related to total volume which is mostly pulpwood in timber sales and regional wood supply. However, timber economic returns and investments tend to focus on higher valued wood, i.e., sawtimber. There is not a glut in the market of high quality sawtimber. Just the reverse is true. There is a high demand for private and public timber sales with quality sawtimber. The demand for this product is also reflected in the significant price increases experienced over the recent decade. All of this indicates that the market has room for both private and public timber management if it can provide a sustained level of high quality sawtimber. This goal has been stated in the current Forest Plan since 1986.

2. **Comment:** “Please include an analysis of all economic resources contributing to the local and regional economy.” (The Wilderness Society)

Response: The economic analysis for the project proposal is found in Section 3.12 of the EA. It is beyond the scope of this project to do a broad economic analysis.

Cultural Resources:

1. **Comment:** “Describe the survey methodology that will be used to search for both historic and prehistoric resources in the Project Area.

Response: The following steps were followed to survey for cultural resources within the Project Area:

- 1) Research was conducted prior to field review to identify cultural resources sites within the area. The cultural resource paraprofessional consulted District cultural resource maps and atlases, District cultural resource files, historic atlases and maps (Wallings and Hurd’s) and additional historic documents [History of Coos County, Fergusson (1888), History of Gorham, NH, True (1882 rev. 1998) and History of Dolly Copp Campground, Chew (1998)]
- 2) The cultural resource paraprofessional conducted a thorough walk-through of each unit in the proposal with particular attention to areas near streams, on benches or other flat areas, rock outcroppings and ledges.
- 3) The Forest Archeologist prepared and reviewed the cultural resource report.
- 4) The State Historic Preservation Officer (SHPO) reviewed the cultural resource report and provided concurrence on 7/16/03.

General Comments:

1. **Comment:** “The affected environment includes more than just the HMU itself and the analysis of the effects must look beyond the confines of the HMU boundaries.” (The Wilderness Society)

Response: The Affected Environment may vary by resource (i.e. vegetation, soils, water, wildlife, fisheries, etc.), and the Analysis Area used to determine effects on the resource may vary accordingly. For some resources, the cumulative effects Analysis Area may be defined by HMU boundaries (i.e. vegetation, recreation); and for others it may be defined by some other feature (i.e. water; visual quality). The Affected Environment portion of each resource section provides for the rationale for the size and extent of the Analysis Area used cumulative effects analysis.

APPENDIX D – Mitigation Measures

Vegetation

- To ensure that early-successional species are present in mature hardwood stands for wildlife, a component of mature aspen, paper birch, and softwood would be reserved. For paper birch, 2 or 3 mature or over mature trees would be reserved per acre. For aspen, 2 or 3 mature or over mature trees would be reserved per acre and for softwoods, reserve small inclusions of 2 or 3 trees per acre.
- Beech trees genetically resistant to scale complex would be reserved from harvest.
- The sale administrator will lay out main skid trails through the stands before harvesting begins. This will reduce the area affected by skid trails in the stand, thereby reducing the number of trees damaged.

Recreation

- Campers at Barnes Field will be informed of logging activities occurring in the area which may cause noise and visual disturbance.

Mitigation measures to reduce safety hazards to hikers on the Daniel Webster trail include:

- Signs will be posted along the trail informing hikers of harvest activities.
- Skid crossings will be limited to minimize contact between hikers and logging equipment and to protect the existing trail tread as much as possible.
- Slash will be pulled back 50 feet from the trail to avoid walking hazards to hikers.
- The tread way will be cleared of debris to maintain trail directionality.
- Harvesting will be conducted in winter during low usage periods.
- Only high risk trees will be marked with a 50' buffer (25' on either side) of the trail.

Mitigation measures to help minimize conflict between users of Forest Road 72 (Culhane Brook Road/Hayes Copp ski trail) are:

- Where possible, short detour routes will be created and packed to allow recreationists access to unaffected portions of the trail system.
- Safety hazard signs will be posted on the ski trail to warn about logging operations.
- Speed limit signs will be posted on the Culhane Brook Road.

Mitigation measures to provide safeguards for snowmobilers and loggers using FR 207 (Pinkham B road) during harvesting of stands 33/4, 33/5 33/58, 33/59, 33/41 and 33/42 are:

- Where possible, the Pinkham B Road and Bear Springs roads would be plowed at a width that allows dual use by snowmobiles and logging trucks.
- Where dual use cannot be avoided, logging operations would not be allowed on holidays and weekends.
- Safety hazard signs would be erected on snowmobile trails to warn about logging traffic.
- Speed limit signs would be posted on the Pinkham B road.

Mitigation measures to provide safeguards for snowmobilers using Corridor 19 trail are:

- Loggers will directionally fell all trees away from snowmobile trail.
- Trail will be kept free of logging debris.

Visual Quality

- Slash disposal zones would be along the FR 263, FR 72 and FR 207, the Daniel Webster Trail, and Corridor 19 snowmobile trail. All slash would be removed within 50 feet of the roadway and lopped to within 3 feet of the ground for another 50 feet.
- The number of skid trails across the Daniel Webster trail would be limited to reduce visibility of ground disturbance.

Soils

- For landings that are designated as a permanent wildlife opening (40/58 and 41/34), limit the area used for a landing to minimize soil compaction from heavy machinery. If adequate topsoil is left upon completion of harvesting, scatter any remaining slash on landing. Seed only if native vegetation is not likely to grow on the site. If topsoil is removed and the site is compacted, revegetate with winter rye and allow native vegetation to reestablish over time. If needed use straw as mulch.
- At the completion of the timber harvesting activity, skid trails and temporary access roads to landings will be water barred and seeded with winter rye where there is exposed mineral soil and risk of erosion. With few exceptions, this should prevent soil erosion.

Water

- Any harvesting within 100 feet of a perennial stream will maintain at least 70% crown closure (SPNHF 1997).
- Trees adjacent to the channel will be retained to provide structure and stability and stream crossings will be in designated locations.
- Trees will be felled directionally away from streams where possible.
- Monitor stream crossings that need restoration and continue to treat until stabilized.
- For stream crossing during the winter, ensure ice is thick and ground is frozen. Where these conditions are not met, use additional mitigations such as more sediment and drainage control and alternate crossing structures.
- The timber sale contract will contain clauses entitled "Prevention of Oil Spills, CT 6.341", "Sanitation and Servicing CT 6.34", and Hazardous Substances CT 6.342, requiring the timber purchaser to take preventive measures to ensure that any spill of petroleum products does not enter any stream.
- Roads will be located on slopes 40 percent or less.
- Where needed, silt fence or another effective methods will be used prevent sediment from reaching a stream course disturbed by crossing areas.
- Watershed protection measures such as waterbars and sediment control will be maintained as considered necessary until no longer needed.
- Stream crossings will be restored, as needed using shaping, matting, seeding, or other effective methods to restore stream morphology and function.
- Install stream-crossing structures at right angles to the stream channel in straight sections.

Fisheries

- Within stream channels that support brook trout, bridge and culvert and bridge installations that have the potential to disturb soils would be installed during the period of May 1 to September 15 to protect spawning and egg rearing habitat.

Wildlife

- During the raptor nesting season, avoid harvesting activities within 0.25 miles of known, active raptor nests. Maintain an uncut buffer of at least 66 feet around known raptor nest trees and retain 65-85% canopy closure within 165 feet of any nest (Flatebo 1999).
- No harvesting or associated harvest activities would occur within stands 33/41 and 33/42 after January 31st to minimize disturbance to nesting goshawks.
- During harvesting, avoid disturbing existing large woody material on the ground, especially hollow logs greater than 18 inches in diameter. Exceptions may include skid trail locations that cannot be moved to avoid such material because of land features.
- Beech trees with an abundance of bear claw marks should not be marked for cutting unless the tree is expected to die in the near future. Exceptions may include hazardous trees or parts of skid trails or landings that cannot be moved because of land features. Another exception would be in regeneration harvests designed to create optimum conditions for the regeneration of paper birch, aspen or softwoods. In these instances, beech trees may be reserved to meet requirements for reserve patches or wildlife trees. In areas with heavy concentration of bear trees, patches of habitat will be reserved to minimize damage to the trees.
- To have the least impact on wildlife that roost or feed in dead and decayed trees, snags will be left standing unless they pose a threat to personal safety during harvesting activities or they lie within a necessary skid trail location. When implementing Forest Plan Standards and Guidelines for wildlife trees (Forest Plan III-15 and Appendix B-21 as amended in April, 2001), priority will be given to trees that have existing or potential exfoliating bark and observable cavities.
- Vernal Pool Recommendations (from Carlson and Sweeney 1999): Vernal pools are defined as naturally occurring seasonal, semi-permanent or permanent bodies of water, free of predatory fish populations, that provide breeding habitat for certain amphibians and invertebrates. To guide forestry activities, the vernal pool and surrounding area can be divided into three management areas.

Vernal Pool: The vernal pool depression is the area that is saturated at the time of spring high water. It may be dry during summer or early fall. This depression should remain in an undisturbed state year-round; specifically, the soils should not be compacted or excavated, vegetation should not be disturbed and the area should remain free of slash and sediments associated with harvesting.

Vernal Pool Protection Zone: The area within 100 feet of the edge of the vernal pool is important to maintain water quality, provide shade and leaf litter, and habitat for migrating amphibians. A forest having at least 70% canopy cover should be maintained and the forest floor should be kept free of ruts, bare soil, and sources of sedimentation. Where possible, harvesting activities should occur during winter when the ground is frozen in order to minimize possible rutting, litter disturbance

and sedimentation. However, careful operations under dry conditions can also minimize these effects.

Upland Amphibian Habitat: Amphibians live in the associated upland habitat for the majority of the year. Where possible, in this zone (between 100 and 500 feet from the edge of the vernal pool) forestry activities should a) minimize disturbance to the forest floor by using controlled yarding, harvesting on frozen ground, and avoiding location of landings and roads in this area; b) maintain natural litter composition by avoiding stand type conversion; c) maintain coarse woody material by leaving limbs onsite (including snags for future down wood) and, d) maintain a shaded and moist forest floor with at least 60% canopy closure.

- Contract provisions will ensure protection of any known T&E plants as well as those identified during the contract term.
- Any prescribed burning of the permanent wildlife opening (33/86, 34/45 and 41/34) will follow guidelines outlined in an authorized prescribed burn plan.
- Mowing or stumping of the permanent wildlife opening would occur during dry site conditions, usually between late July and November.
- All logging equipment would be cleaned prior to entering the Project Area to prevent the spread of invasive species unto the Forest.
- Provide a no-cut buffer in stand 33/41 along the Peabody River, below the 1100 foot contour to protect the high energy riverbank community described by Engstrom & Sperduto (1994).
- Exclude harvesting within wet areas in stands 33/41 and 33/42.
- Minimize period from end of logging to site preparation, revegetation, and contract closure to minimize potential for spread of invasive plants into Project Area.
- Revegetate disturbed soil in a manner that optimizes plant establishment for that specific site. Use native material where appropriate and feasible. Where impractical, use a non-persistent, fast-growing species like annual rye.
- To prevent weed germination and establishment, retain native vegetation in and around project activity. Retain a 50-100-foot buffer of vegetation between infested roadways/trails and proposed clearcuts, patch cuts and seed tree cuts.

Heritage Resources

- Timber markers will create a buffer around any discovered Heritage Resource sites by not marking trees within one-and-one-half tree lengths from artifacts.
- The Sale Administrator will ensure that skid trails and felling/skidding operations do not interfere with any of these sites.
- If unknown sites or artifacts are located within the Project Area, harvesting would be halted until the Forest archaeologist or district paraprofessional could evaluate the findings and make recommendations on how to proceed.
- Skid roads across the stone wall in stand 42/5 would be limited to one or two crossings at designated locations.
- Cultural resources would be identified on sale area maps and in the timber sale contract.
- Provisions within the timber sale contract would address protection to heritage resource sites should any be discovered within the Project Area.

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APPENDIX F – Glossary

Basal Area (BA) - The area of the cross section of a tree a 4.5 feet above the ground. Generally expressed as total Basal Area per acre. Under uneven-aged management, usually 30 to 40 percent of the basal area is removed. Under even-aged management, 30 to 100 percent of the basal area is removed depending upon the needed silvicultural treatment.

Ecological Land Type (ELT) - An area of land with a distinct combination of natural, physical, chemical, and biological properties that cause it to respond in a predictable and relatively uniform manner to the application of given management practices. In a relatively undisturbed state and/or at a given stage (sere) of plant succession, an ELT is usually occupied by a predictable and relatively uniform plant community. Typical size generally is several hundred acres.

Ecological Land Type Phase - These are subdivisions of those ELTs where vegetation management is most common. They share the same characteristics as ELTs; however, their size is smaller (10-100 acres) and the biological and physical conditions are more limited. They are locally known as Forest Habitat Types.

Even-aged Management - A timber management system that results in the creation of stands where trees of essentially the same age grow together. Harvest methods producing even-aged stands are clearcut, thinning shelterwood, and seed tree.

Clearcutting - removal in a single harvest of the entire stand to prepare the area for rapid seed germination and growth of a new even-aged stand of shade intolerant trees. Shade intolerant trees are tree species that need full or near full sunlight to regenerate and grow.

Salvage Cut - Trees are harvested after some natural disturbance in order to salvage potential wood products before the trees become less valuable or unmerchantable. Depending on the severity of damage, the harvest may consist of harvest of individual trees or of groups of trees. In severe cases, all trees in a stand may be removed to begin a new stand. Disturbances include but are not limited to wind, ice storms, fire, insect infestations and disease.

Seed Tree – A harvest that leaves five or so dominant trees per acre as a seed source for the regenerating stand. A seed tree harvest appears similar to current clearcut units in that both prescriptions leave individual trees standing per acre within a unit to meet silvicultural or other resource objectives.

Shelterwood - This harvest method provides a source of seed and shade protection for regeneration. The original stand is removed down to a prescribed basal area, in

two or more successive harvests. The first harvest is ordinarily the seed cutting (sometimes called the regeneration cut). A second harvest often follows a number of years later once regeneration is well established, and is referred to as a final harvest or shelterwood removal harvest. An even-aged stand results.

Thinning - Thinning operations where the harvested material can be sold on the market as opposed to pre-commercial thinning.

Forest Product - Sawtimber, millwood, pulpwood, and chipwood are the raw products utilized from a tree in a minimum piece length of 8 feet.

Sawtimber minimum piece specification requires a minimum diameter outside bark of 9.0 inches for softwood and 11.0 inches for hardwood and 40 percent sound wood.

Millwood minimum piece specification requires a minimum diameter outside bark of 8.0 inches for paper birch and 50 percent sound wood.

Pulpwood minimum piece specification requires a minimum diameter outside bark of 5.0 inches and 50 percent sound and reasonably straight.

Chipwood refers to utilization of that material beyond the merchantable top, including branches and the top. Chipwood does not meet minimum piece specifications for pulpwood.

Habitat Management Unit (HMU) - A large unit of land with boundaries commensurate with compartment boundaries, and which includes a mix of habitat types. At least one of these types must be a pond or stream with wetland potential.

Habitat Type - A small unit of land from a few to over 100 acres lying within a given climatic mineralogical zone and supporting a distinct successional sequence of vegetation growing on a unique type of soil material.

Indicator Species - A plant or animal species adapted to a particular kind of environment. The arrangement of habitats (by tree species and age group) reflects requirements for selected wildlife species. They are designated a management indicator species. Their presence is sufficient indication that specific habitat conditions are also present. These species represent groups of other species with similar habitat requirements.

Interdisciplinary (ID) Team - A group of individuals with skills for management of different resources. An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems. Team member interaction provides necessary insight to all stages of the process.

Projected Existing Condition of Habitat Management Unit - The existing acres of the community type by age class would change over time. The expected changes are projected to a future year that becomes the existing condition for that community type by age class.

Riparian Management Zone - A term used by the Forest Service which includes stream channels, lakes, adjacent riparian ecosystems, flood plains, and wetlands.

Road reconstruction - rebuilding a road to the standard originally constructed. For example, replacing temporary drainage structures, temporary removal of waterbars or other drainage features to allow for traffic, clearing vegetation that obstructs visibility and smoothing and grading road surfaces.

Road construction – building new road.

Temporary road – a low standard road constructed for a single entry with a minimum of disturbance and that is waterbarred and closed following use.

Silviculture - A combination of actions whereby Forests are tended, harvested, and replaced.

Stand (Forest) - A community of naturally or artificially established trees of any age sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities, thereby forming a silvicultural or management entity. A Hardwood Stand is defined as a stand which at least 75 percent of the overstory and understory are hardwood trees. A Softwood Stand is defined as a stand which at least 65 percent of the overstory and understory is softwood (conifer) trees. A Mixed wood Stand is defined as a stand with hardwoods trees mixed with softwoods trees. The 25 to 65 percent of this stand consists of red spruce, balsam fir, and eastern hemlock.

Streams - Non-perennial and perennial are two types of stream that the quantity of water can be measured.

Intermittent Streams - Streams with a defined channel that the quantity of flowing water can be measured except during the dry summer months.

Perennial Streams - Streams with a defined channel that the quantity of flowing water can be measured year round.

Uneven-aged management - The application of a combination of actions needed to maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Harvesting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Harvest methods that develop and maintain uneven-aged stands are individual selection, improvement, and group selection, and salvage.

Individual Tree Selection - A method where individual trees are selected and harvested in a stand while maintaining a prescribed number of trees in each diameter class ("Q" Factor).

Improvement Cut - An interim step to developing an uneven-aged stand structure by removing lower quality stems, leaving a residual basal area of about 65-70 sq.ft. (hardwood) or 80 to 100 sq.ft. (mixed wood) per acre.

Group Selection - A harvest method that describes the silvicultural system in which trees are removed periodically in small groups, resulting in openings that do not exceed an acre or two in size. This leads to the formation of an uneven-aged stand, in the form of a mosaic of age-class groups in the same forest stand.

Overstory Removal – Mature trees are removed to release regeneration once it has become established, for example in a shelterwood final harvest.

"Q" Factor - A method used in uneven-aged management to express the desired number of trees by diameter class. A "Q" factor of 1.5 means that each diameter class would have 1.5 times the number of trees than the next highest diameter class.

Visual Quality Objectives - A desired level of scenic quality. Refers to the acceptable degree of alteration of the characteristic landscape:

Preservation - A visual quality objective that provides for ecological change only.

Retention - A visual quality objective that means that management activities are not evident to the casual Forest Visitor.

Partial Retention - A visual quality objective that means that management activities may be evident but must remain subordinate to the characteristic landscape.

Modification - A visual quality objective that means that management activities may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture.

Volume - The measure of quantity forest products (sawtimber, pulpwood, and chipwood).

Board Foot - A measure of lumber volume for sawtimber. The cubic equivalent of a piece of lumber 12 inches wide, 12 inches long, and 1 inch thick. MBF is the measure for 1000 board feet.

Cord - A measure of volume for pulpwood and millwood. One cord equals one stack of wood measuring 4 by 4 by 8 feet or the equivalent of 500 board feet.

Ton - A measure of volume for chipwood